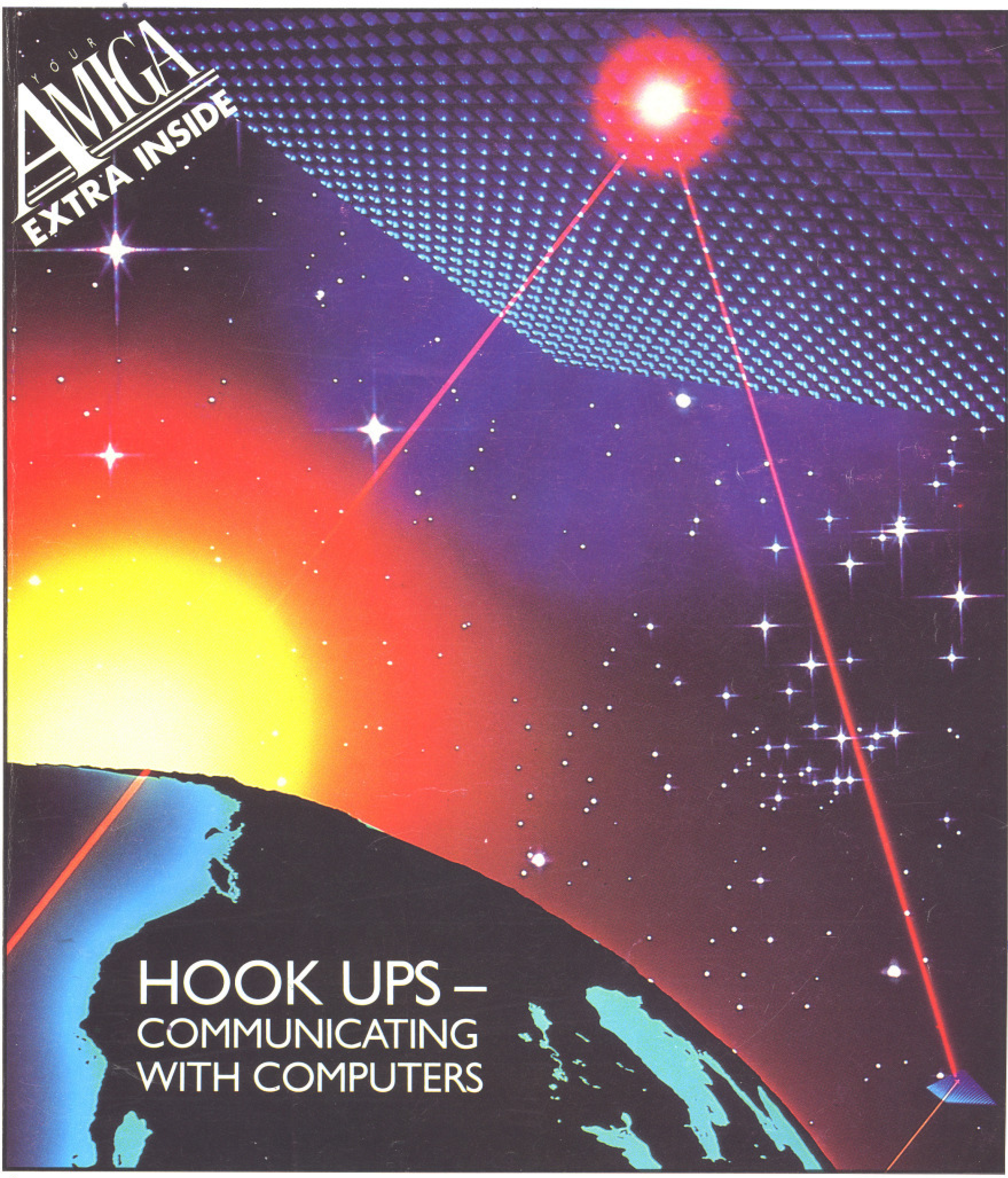
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SEPTEMBER 1987 £1.10



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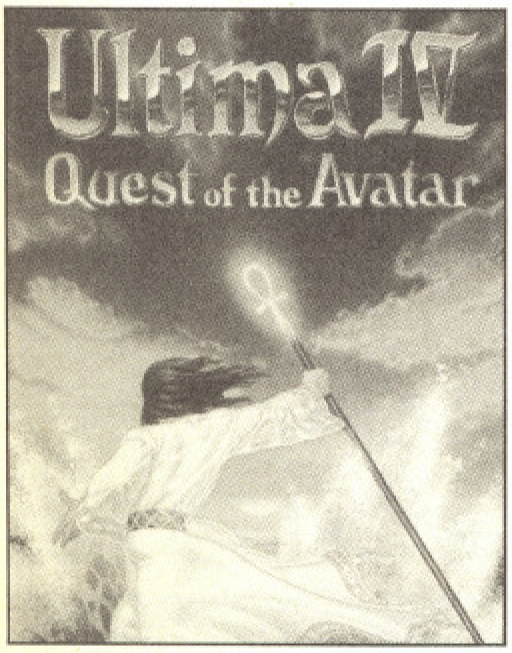
Adventuring

Players of the classic adventure game *Ultima III*, will be thrilled to know that Microprose and Origin Systems has brought the original *Ultima I* from America for the first time and it will be available on the C64.

Ultima I features the evil wizard Mondain who sends demonic minions to ravage the land of Britannia. The champion must overcome all odds to defeat the wizard and deliver the land from its misery.

From the same stable comes *Ultima IV*, the long awaited sequel to *Ultima III*. The game was previously handled by US Gold. The version being released by Microprose is for the Amiga computers.

Pirates is a big new release also from Microprose, and it's a swashbuckling simulation.



The player explores the bucaneer era and becomes a 17th century privateer plundering ships and ports in the Caribbean.

Action is set in exotic ports, taverns, mansions and, of course, on the open seas.

The player must sail the reef-infested waters in constantly changing weather conditions. You also need to master the skills necessary to control a variety of ships such as barques, sloops, frigates and galleons.

It is available on C64 disk priced at £19.95 and on cassette at £14.95.

Infocom has released a new interactive horror story entitled *The Lurking Horror*, in which you explore the world that is peopled by all your worst nightmares.

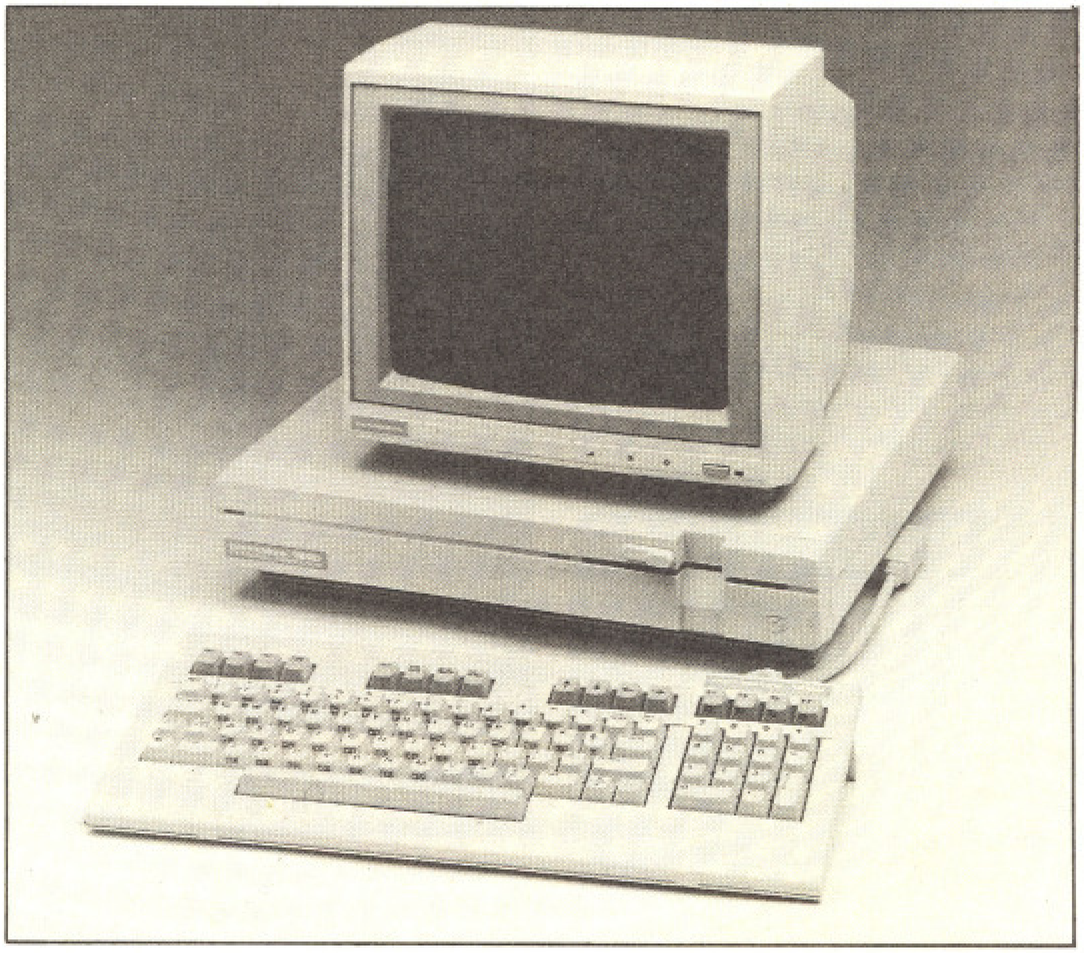
On a blizzard-filled night you are working in your office at the George Underwood-Edwards Institute of Technology. You have forgotten the stories you had heard about the ancient relics in the musty basements. You awaken from a dream and find yourself being dragged downwards as a strange sound seems to get closer...

The Lurking Horror was written by Dave Lebling, the package includes a copy of *G.U.E. At A Glance* and a student ID card.

The game is out on the C64 on disk priced £24.99 and for the Amiga at £29.99.

Touchline:
Microprose/Origin: *2 Market Place, Tetbury, Gloucestershire GL8 8DA.* ***Tel:*** *0666 54326.*
Infocom/Activision: *23 Pond Street, London NW3 2PN.* ***Tel:*** *01-431 1101.*

New Version of 128



Commodore has unveiled a new version of the 128, the Commodore 128D desktop computer.

It is based around the proven technology of the Z80A for CP/M software and 8502 for C64 and 128 series software.

The C128D desktop is designed for business applications and comes with an integral 5¼" disk drive with a capacity of up to 340K and 128K RAM. 128K and 512K RAM expansion packs are available to bring the total storage capacity up to 256K or 640K.

The price of the new C128D is £347.82 with the 128K RAM pack at £99 and the 512K RAM pack at £149. The mouse is £34.77 and all prices exclude VAT.

Touchline:
Commodore (UK): *Commodore House, The Switchback, Gardner Road, Maidenhead, Berks SL6 7XA.* ***Tel:*** *(0628) 770088.*

DATA STATEMENTS

In the Arcades

Ocean Software has brought *Slap Fight*, Taito's latest coin-op success, to the small screen for the C64, price £8.95 cassette and £12.95 disk.

The player must manoeuvre a *Slap Fight* spacecraft over the scrolling landscape of the planet Orac. Eight different icon selected facilities are available including speed, weapon systems and fire power shields and bonuses.

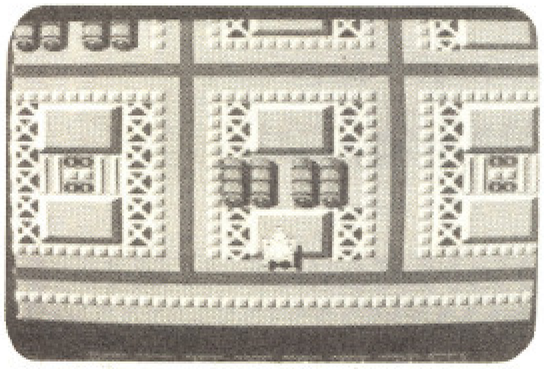
Fast action is needed and as the game gets harder, stamina is all important.

Logotron's highly successful BBC game *Xor* is now available for the C64.

The game features 15 levels of mazes which can all be solved logically. As experience is gained the player realises that strategy and logic are the important qualities for success.

The cassette version is £9.95 and the disk version is £12.95.

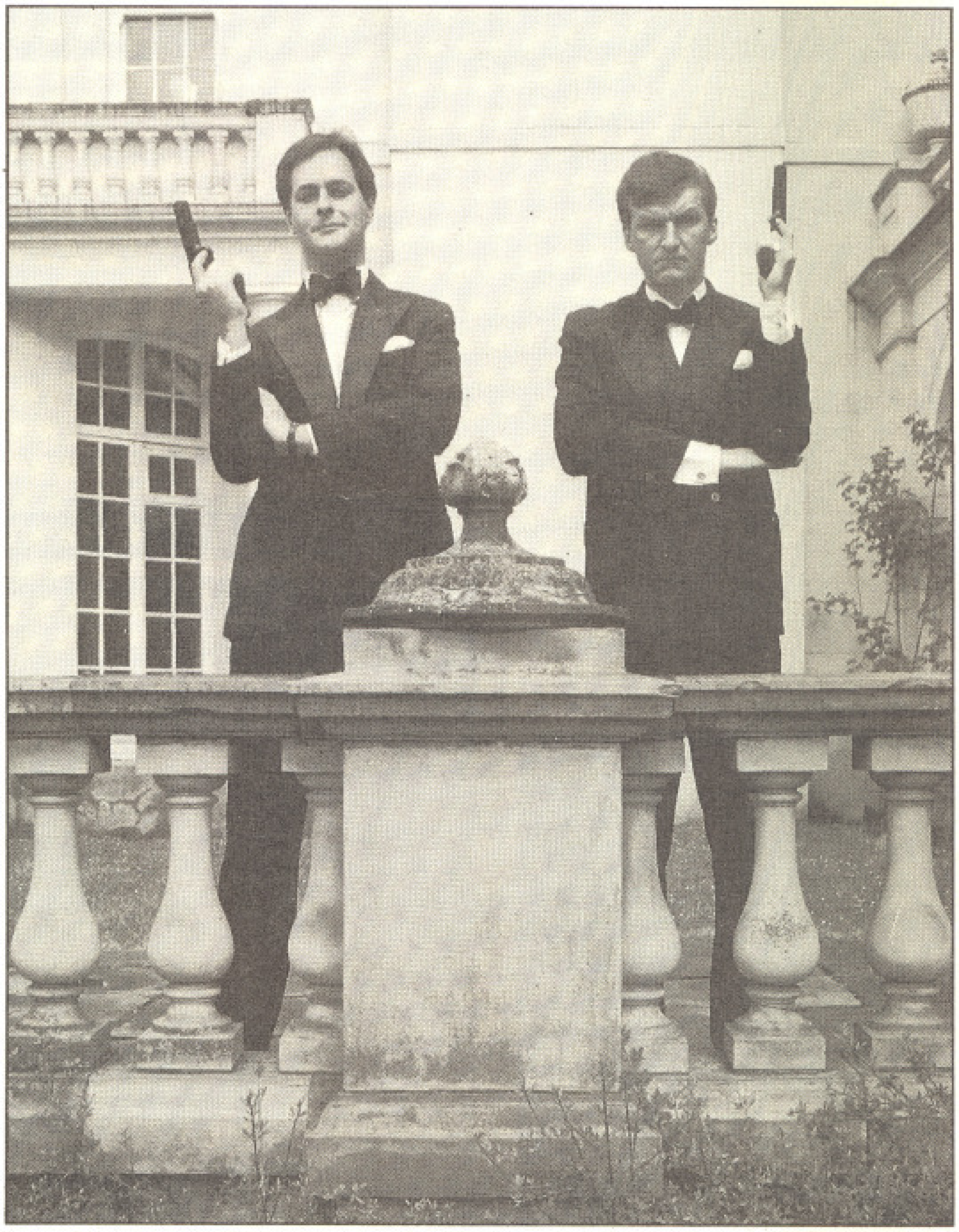
Touchline:
Ocean: *Ocean House, 6 Central Street, Manchester M2 5NS.* ***Tel:*** *061-832 6633.*
Logotron: *Dales Brewery, Gwydir Street, Cambridge CB1 2LJ.* ***Tel:*** *0223 323656.*



OOPS!

We would like to point out a technical inaccuracy in the Metrocross review in our August 1987 issue. The game legend of Kage was incorrectly quoted as being published by US Gold. The game is actually published by Imagine Software.

We would also like to take this opportunity to point out that the opinions expressed in our reviews are the opinions of the reviewers themselves and not necessarily those of the magazine.



Domark: Living Dangerously

Domark, the company which brought *Eureka!* and *Trivial Pursuit* to C64 users, has announced the launch of its second James Bond game – *The Living Daylights*. The release of the game coincided with the premier of the new Bond movie of the same name which stars Timothy Dalton as Bond for the first time.

The game closely follows the plot of the film. Bond, has recently returned from Gibralter and promptly gets sent to Bratislava to mastermind the defection of a KGB general.

Of course, the scenario becomes rather complicated especially with the entrance of the beautiful Kara who eventually ends up a prisoner of the baddies along with Bond himself.

Dominic Wheatley and Mark Strachan, ever willing to enter into the spirit of the occasion, dressed to kill in Bond dinner jackets when they went to Pinewood Studios.

The Living Daylights is now available from Domark on the C64/128.

Touchline:
Domark: *Domark House, 22 Hartfield Road, Wimbledon, London SW19 3TA.* ***Tel:*** *01-947 5622.*

DATA STATEMENTS

Epic News

US Gold has announced four major new releases from Epyx. There are two utilities and two games in the new collection.

Create a Calendar is a versatile personal publishing tool designed to create specialised calendars for schools or businesses.

Calendars can be customised with a wide variety of text, graphics and borders for occasions as diverse as birthdays and dental appointments.

Users can print daily, weekly or annual calendars and include a list of events to be filled in.

Print Magic is a utility package designed to help create cards, certificates, flyers, stationery and banners. It gives the user freedom and speed and a wide choice of spectacular artwork. Graphics can be enlarged or shrunk and flipped and rotated to the user's specifications. There is a choice of fonts and the option to create new ones.

In the games department Epyx has released two fast-moving sport titles; *California Games* and *Street Sports Baseball* (the first in a series of Street Sports titles).

California Games brings the fun and glamour of the West Coast outdoor life to your screen. In Hollywood you can go skateboarding, or roller skate on Venice beach. The waves of Santa Cruz are the setting for the surfing competition and there's frisbee throwing in Yosemite Park, plus BMX trials and 'hacky sack' competitions in other famous locations.

Street Baseball allows the player to master America's favourite sport in the streets, where many a star first had a stab at it.

There are 16 neighbourhood kids who all have different skills in pitching, batting and fielding. If you pick the right combination of players you could be in for a worthy victory with your team – The 52nd Street Hall of Famers.

Touchline:

Epyx: *US Gold, Units 2 & 3 Holford Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021-356 3388.*



The AMX Mouse with Stop Press desktop publishing package for the Commodore 64 and 128.

Utility File

System Software has released *Ram-Disk*, described as 'the genuine alternative to a floppy disk at a fraction of the cost'.

Ram-Disk provides exactly the same commands as a Commodore disk drive: DIRECTORY, LOAD, SAVE, VERIFY, OPEN, CLOSE, COPY RENAME and many others.

Ram-Disk is loaded into the C64 and the user then has access to a 'soft disk drive' without losing memory from Basic. It's available on tape only, pirce £9.95.

There is a version of *Ram-Disk* on disk for the C64 and this speeds up the disk drive and its commands and still leaves all Basic free. It costs £14.95.

In the States, British-made utility software is doing well against home grown rivals. Precision Software's *Superbase Personal* for the C64 carried off the Software Showcase Productivity Award at the Consumer Electronics Show in Chicago, this summer. This is the second time Precision has won the award – *Superbase 64* was the taker in 1984.

Advanced memory Systems has also announced a major deal for its AMX Mouse and *Stop Press* desktop publishing package. AMS director Nick Pearson said: "We have sold this product to Electronic Arts, who are confident of achieving the same high level of sales in America as we have with similar packages in Britain and Europe."

The AMX Mouse and *Stop Press* retail at £69.99. *Stop Press* itself costs £39.99.

Touchline:

System Software: *16B Worcester Place, Oxford OX1 2JW.* ***Tel:*** *0865 54195.*

AMS: *MCC PR, Old Bank House, Old Market Place, Altincham, Cheshire WA14 4DL.* ***Tel:*** *0925 413501.*

Precision: *6 Park Terrace, Worcester Park, Surrey KT4 7JZ.* ***Tel:*** *01-330 7166.*

DATA STATEMENTS

Print Quality

Precision Software has announced the launch of a high speed, low cost, dot matrix printer, the Precision 4010.

The price is £389 plus VAT or it can be bought packaged with either Precision's *Superbase Personal*, a GEM or a mouse or with *Wordperfect Executive*. Both packages cost £469.

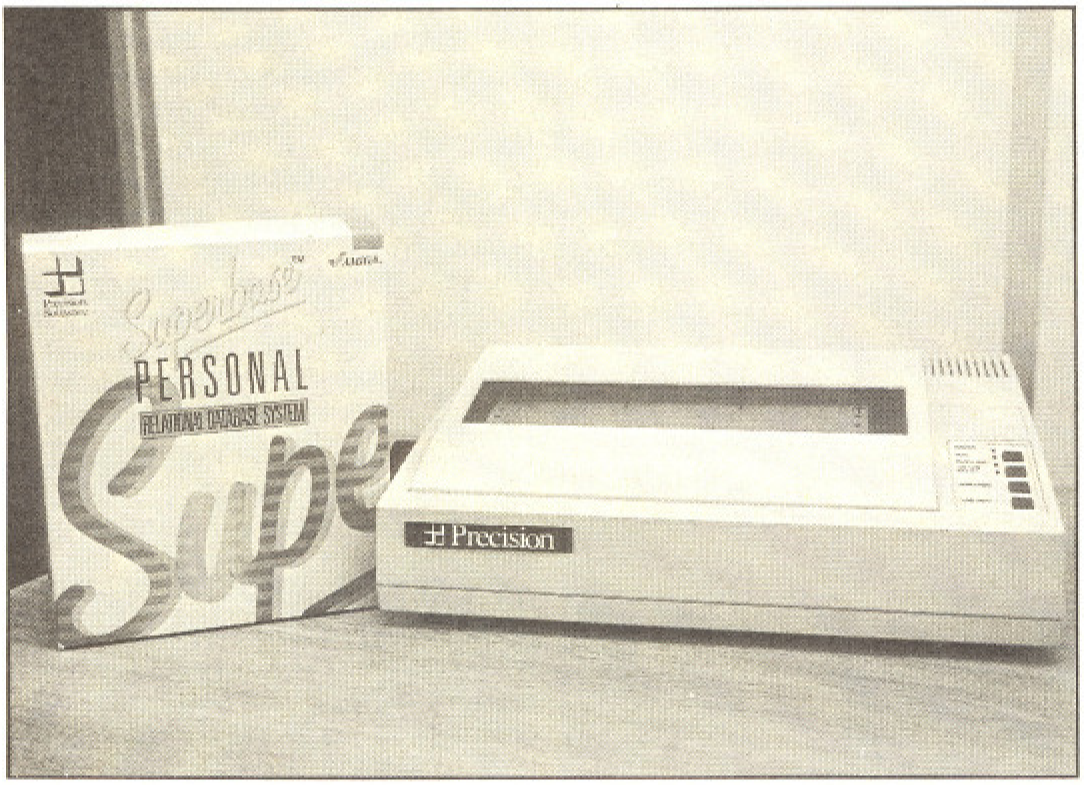
The printer owes its speed, 252 lines per minute draft and 55.8 lines per minutes NLQ, to its four print heads.

The Precision 4010 is the first hardware based product from the company and will be handled by Precision Distribution. Richard Binley, divisional director for distribution said: "We intend to launch a series of Precision-badged lines to expand our already comprehensive product list."

Staying in the printer market, York Electronic Research (YER) has launched an RS232 printer/modem interface for the C64. The package comes with a cable, 4000 word manual and a disk or tape of utility software including a terminal emulator. The manual describes the hardware, the RS232 standard and contains a step by step trouble shooting guide. The whole package costs £29.99.

YER has also released an editor/assembler for the C64 on tape or disk which eliminates the frustrations of the edit/assemble/test cycle. It costs £12.99 and can assemble up to 38K in one operation.

Touchline:
Precision: *6 Park Terrace, Worcester Park, Surrey KT4 7JZ.* ***Tel:*** *01-330 7166.*
York Electronic Research: *The Fishergate Centre, 4 Fishergate, York, YO1 4AB.* ***Tel:*** *0904 610722.*



In the Future

A new game from Martech, set in the year 2032, is based on a spy and laser satellite network. The game is called *The Armageddon Man* and the player must control the spy satellite network from the Satellite Olympus. There are now 16 superpowers and the balance of power must be maintained between all of them. This is the task of the Armageddon Man.

The package comes complete with a colour vinyl map of the world and vinyl re-useable flags of each nation, with which you can plot changes in alliances between the powers.

The cassette version costs £12.95 and the disk version is £14.95 (C64).

The first major new release from the Microprose/Origin joint venture is entitled *Autoduel*. It is a futuristic, fast pace strategy roleplaying game based on the American board game *Car Wars*. It is now available for the C64 on disk only.

Star Paws is a new title from Software Projects for the C64/128 and it stars Captain Rover Pawstrong. The game comes at only £5.95 on cassette and £10.95 on disk.

Touchline:
Martech: *Martech House, Bay Terrace, Pevensey Bay, East Sussex BN24 6EE.*

Pocket Prices

Budget software house Code Masters has released three new C64 titles, all at £1.99.

In *Lazer-force*, there are 30 main levels and two bonus stages. In the first section of the game a scrolling landscape of erupting volcanoes must be negotiated. And in later levels the landscapes eventually mutate.

Also for the C64 are *Super Robin Hood* and *Thunderbolt*.

Pocket money firm, The Power House has released a budget compilation for the C64. The tape features eight different games and is priced at £9.99. Included in the compilation are *Gods and Heroes*, *Terminator*, *Aftermath*, *Return of the Space Warrior*, *Hercules*, *Sqij*, *Xenon Ranger* and *Gun Runner*.

There is also a C64 utility tape for £9.99 featuring the two programmes *Vidcom* and *Ultrakit*.

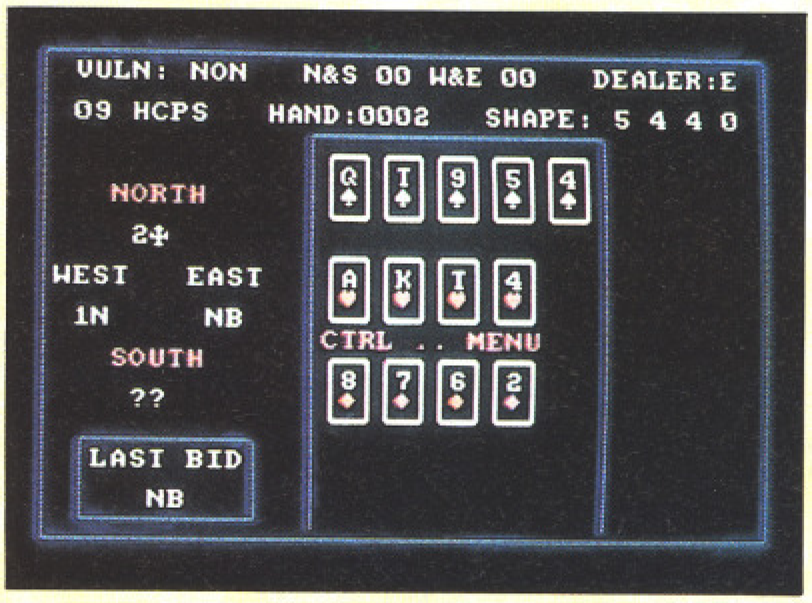
Touchline:
Code Masters: *1 Beaumont Business Centre, Beaumont Close, Banbury, Oxon.*
The Power House: *204 Worple Road, London SW20 8PM.* ***Tel:*** *01-879 7266.*

IQ

If you hate shooting aliens and feel that you need something more intellectual to stimulate your grey matter than look over this selection of games.

COLOSSUS BRIDGE – An Expert Talks

Another bridge program and something of a difference in the review. The game comes packaged with a book — *Begin Bridge* by G.C.H. Fox, one of the country's leading bridge teachers. It seemed appropriate therefore to look at the package from two points of view; that of the experienced player and also from someone who is just learning how to play the game.



The game comes in two parts. There is a mini-tutorial of ten example hands designed to illustrate various aspects of playing bridge. The trouble with these is that they are poorly chosen and are not really suitable for beginners. The on-screen analysis looks messy; layout could have been improved 100% and the odd spelling mistake and bug that crashes the program doesn't help matters either.

The main program is the one that lets you get down to actually playing some hands. You always play the south hand unless south happens to be dummy, in which case you play north. There are a whole host of features available to you which include rebidding or replaying a hand, having cards recommended to you and inputting your own hands. Onscreen presentation is reasonable although a joystick option would have been nice — moving the cursor over the desired card or bid.

All these options are cosmetic though and my non-beginner is going to want to know how well the game plays. The answer is not very well I'm afraid, either in bidding or card play. This is nothing particular to Colossus Bridge, but to all bridge programmes so far released. Bridge, unlike chess, does not lend itself to computer analysis.

Is the program worth buying then? A guarded yes if you are constantly short of people to play with. Don't expect it to do wonders for your game though. Now let's hear what *Your Commodore*'s resident beginner made of it all. **G.H.**

COLOSSUS BRIDGE – The Beginner's Tale

I was quite pleased to see that a Bridge program had turned up in Your Commodore's office. I've only just started learning the game in the past month or so, can't play for toffee, and a computerised tutorial is just what I need.

Unlike chess, bridge is, a pre-eminently social affair — you need four for a game and it helps to be on speaking terms with your partner. A computerised opponent avoids all the embarrassment of playing with people vastly better than you, and human players won't let you bow out gracefully before the end.

Sadly, my hopes were mostly to be dashed. I'd much rather spend my time with a book than try to hack through Colossus's Bridge Tutorial. I feel that the analysis screens could be useful, being written by various experienced players, but they're almost unreadable, and the program only provides ten specimen games anyway, so it's hardly worth even starting. As for the game screens, the less said the better.

The actual Bridge playing part of the program looks even

tackier, but this has a lot more going for it. I don't see how it would interest a good player, but for someone like myself, who is struggling to make obvious tricks, it's a challenge at times. It can't be too clever though, because I can beat it most of the time. I also like the range of options the game offers, such as replaying the hand, playing it open or playing only hands with a 'balanced shape'.

There isn't much excuse for the primitive look of this program, nevertheless I felt I learnt the odd thing or two, if only how to score, so it can't be all bad.

F.F.

Touchline:

Name: *Colossus Bridge.* ***Supplier:*** *CDS Software.* ***Tel:*** *0302 21134.* ***Machine:*** *C64.* ***Price:*** *£11.95 (ca) £14.95(d).* ***Originality:*** *3/10.* ***Playability:*** *5/10.* ***Graphics:*** *1/10.* ***Value:*** *3/10.*

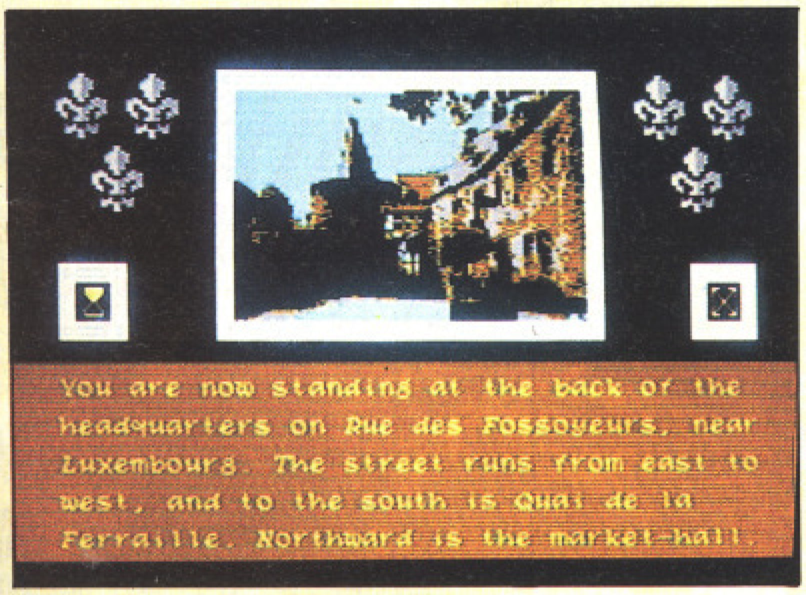
THE THREE MUSKETEERS

The Three Musketeers is the first in a planned series of computer novels from the Swedish software company with the somewhat curious name of American Action.

The format of the game is that of a multiple choice graphic adventure, and as such, should appeal mostly to younger players.

You play the part of D'Artagnan, the fourth Musketeer and you're entrusted with carrying out a secret mission for the Queen involving the theft of some diamonds. Behind the plot is the evil Cardinal Richlelieu who wants to expose the Queen's love affair with the Duke of Buckingham.

The story starts in the streets of Paris where you must find three erstwhile colleagues, Portos, Athos and Aramis and persuade them that there are more important things in life than wine, women and song. You must also secure passes to let the three of you out of the city gates before heading off towards England.



Movement in the game is controlled via the four function keys. Onscreen prompts inform you if there is more text to be read or a choice to be made. Most of the time, the correct option is fairly easy to guess but even if you get it wrong, the first section is small enough for you to try all the available options without taking too much time over it. You are allowed one RAMsave per section but annoyingly, there is no permanent save facility so that if you make a mistake in the later sections, the whole game has to be started from scratch.

Onscreen presentation is good with some attractive illustrations and a redefined character set. My own feeling though is that there is not enough meat in this game to keep seasoned adventurers happy for very long.

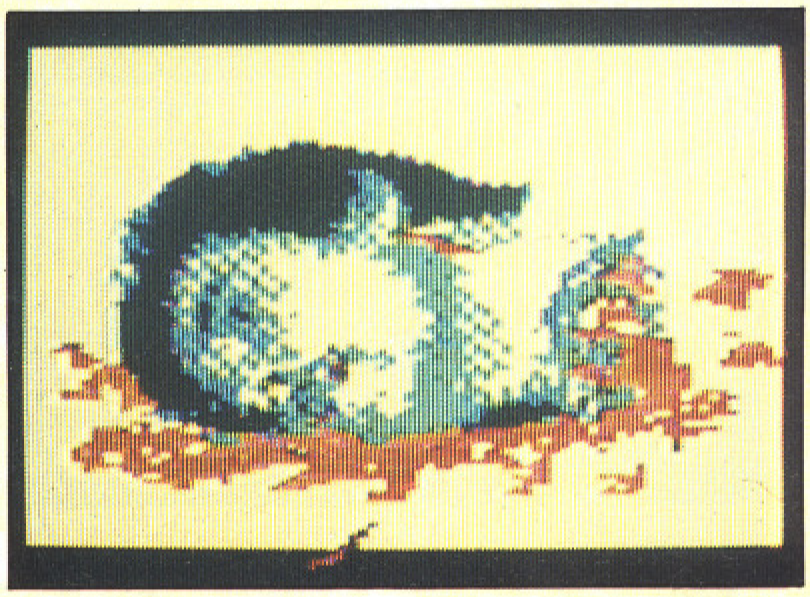
G.R.H.

Name: *The Three Musketeers.* ***Supplier:*** *American Action (UK supplier not known).* ***Machine:*** *C64 – disk only.* ***Price:*** *TBA.* ***Originality:*** *7/10.* ***Playability:*** *7/10.* ***Graphics:*** *8/10.* ***Value:*** *5/10.*

FRANKENSTEIN

CRL is rapidly becoming the Hammer Horrors of the software world. After sinking our teeth into Bram Stoker's Dracula, we are now invited to sample the Mary Shelley monster hit, Frankenstein.

Strip away the gory digitised graphics and what have we got? A trio of short adventures based on the book. In the first two parts you assume the role of Frankenstein in his search for the monster. Starting at your father's house you progress through to the meeting with the old blind man and the showdown with the monster. Part three is the monster's tale.



The parser leaves a little to be desired, giving weird responses to some of the requested actions. For example, I discovered a picture of Frankenstein's parents and suggested that it should be burned. The computer claimed to have done this but when I checked the inventory, the picture was still there.

The response time is a little slow too and because the input buffer appears to be one character long, there is no opportunity to type ahead through locations you have visited before.

Dying happens too often for my liking. Like some of the Level 9 adventures, the sands of time are running out from the beginning of the game. You only have a few moves to vacate the bedroom in your fathers house before the roof comes crashing down in a storm. When you do get out, you find yourself trapped in the living room with no obvious way out. The solution is not obvious and eventually I ran out of things to examine. In despair I sat down and paused for thought. Immediately Frankenstein's father entered, opened the door and disappeared back to his room.

After this you have to negotiate that much loved invention of adventure writers — the maze. With a bear hot on your trail it takes several deaths before you find your way through.

As you can see this is not an easy adventure to get on with. The only way to progress is to save the game regularly and be prepared for anything.

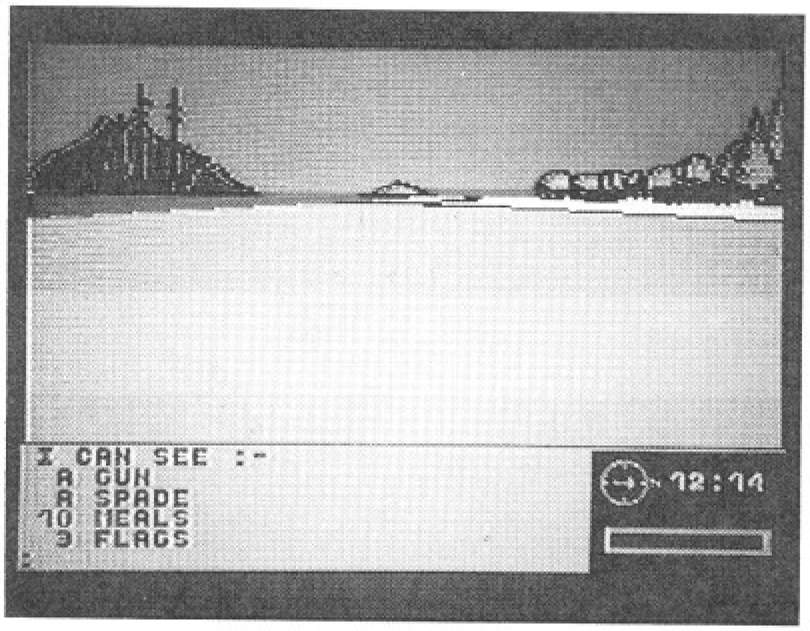
The graphics are bordering on video nasty level. I'm surprised that CRL got away with a 15 and over age limit and not a maximum 18 certificate. Severed heads, blood and guts festoon the screen for disk users.

As a sequel to Dracula, this game lacks the atmosphere of evil and is more sick than successful in achieving its aim to entertain.

E.D.

Touchline:

Name: *Frankenstein.* ***Supplier:*** *CRL.* ***Tel:*** *01-533 2918.* ***Machine:*** *C64.* ***Price:*** *£8.95.* ***Originality:*** *5/10.* ***Playability:*** *3/10.* ***Graphics:*** *5/10.* ***Value:*** *3/10.*



TREASURE ISLAND

Ten years after the original trip to Treasure Island you're on your way back with Long John Silver as a partner! This seemed like a good idea when he told you that he'd found out that the bulk of Flint's treasure was still buried there! Now you're not so sure, after all that's happened, can you trust him?

As the game unfolds you realise that it wasn't a good idea at all as your main objective must be to survive and that isn't going to be easy. Unlike other adventures in Treasure Island, Jim Hawkins (that's you) must eat and drink regularly otherwise you'll run out of energy and die leaving all the booty to Long John Silver. If that wasn't enough you're limited to what you can carry and must type in either RUN, WALK, WADE or SWIM to move anywhere.

The daft thing is that if you happen to walk into water you flounder around and climb out exactly where you don't want to be but if you wade you're OK. Why can't you walk or run and then automatically wade if you hit water and swim if it's too deep? It might actually make the game playable.

All this doesn't help a game that's desperately slow to play, as each location is represented by painfully slow graphics while the game clock races away at one hour, every four minutes.

T.H.

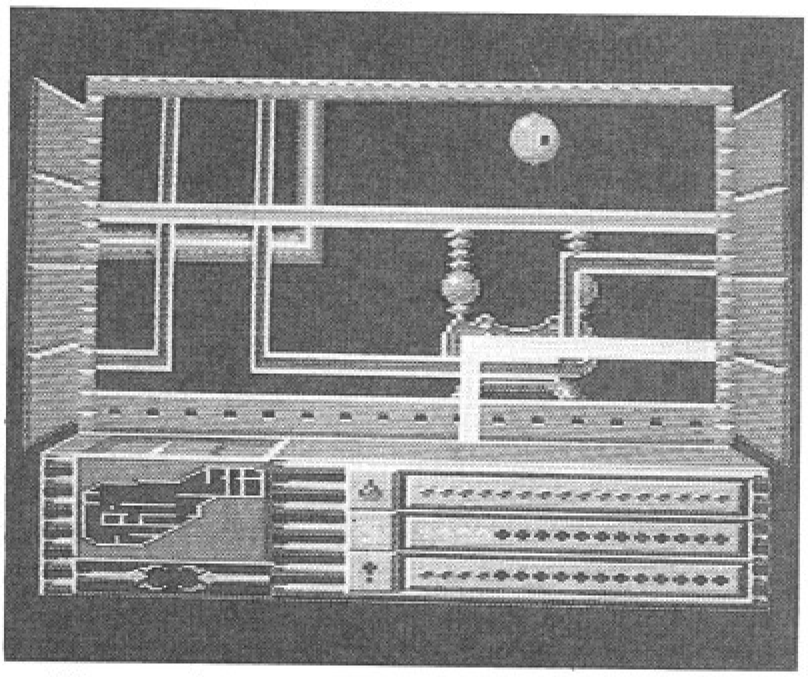
Touchline:

Name: *Treasure Island.* ***Supplier:****Mastertronic.* ***Tel:*** *01-377 6880.* ***Machine:*** *C64.* ***Price:*** *£1.99.* ***Originality:*** *5/10.* ***Playability:*** *3/10.* ***Graphics:*** *5/10.* ***Value:*** *5/10.*

RASTERSCAN

After being on the wrong side in a deep space skirmish the Rasterscan is a wreck and is drifting slowly towards the nearest star. Your job as a small service robot is to repair the ships systems and save yourself and the ship from a fiery destruction.

M.S.B. (that's you) has also been damaged and since your only remaining program is how to repair toasters you're in for an uphill struggle.



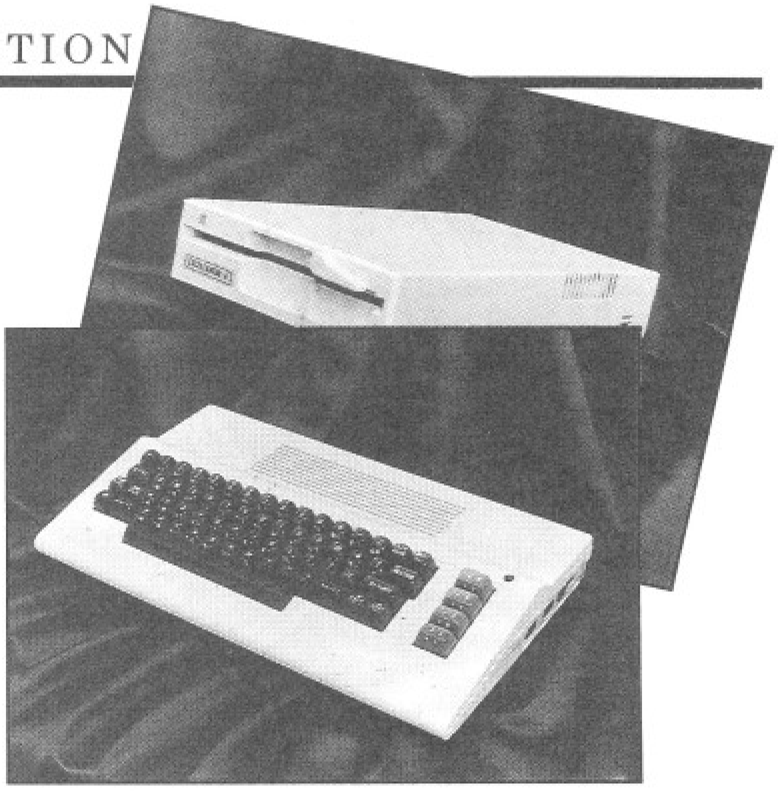
The game is in fact an adventure without any text and features logic problems that must be solved using a joystick. For example, the generator is down because a fuel pipe is broken which you must locate and replace with a spare pipe from the stores (once you've found them) but you must hurry as the back-up batteries that are working now are running out. Once you've done that you have to fix the engines, flip on the right combination of switches to turn on the scanner and finally steer the ship to safety.

I found the game was hard enough without the uncontrolled movement of the M.S.B. slowing down the action as it hurtles around the ship which flips screens at an alarming rate that's guaranteed to distract anyone. This is a shame as there's a good game trying to get out.

Touchline:

Title: *Rasterscan.* ***Supplier:*** *Mastertronic.* ***Tel.*** *01-377 6880.* ***Machine:*** *C64.* ***Price:*** *£1.99.* ***Originality:*** *6/10.* ***Playability:*** *4/10.* ***Graphics:*** *5/10.* ***Value:*** *6/10.*

Win an Excelerator +



An Excelerator + and 10 slimline 64 cases are up for grabs in this month's competition.

For this month's competition we have teamed up with Evesham micros to offer a bundle of superb prizes.

An Excelerator + is up for grabs as the first prize and 10 runners up will each receive one of Eveshams superb new cases for the C64, Slimline 64.

Just in case you haven't come across the Excelerator + before it offers complete compatibility with Commodores 1541 drive while being much smaller and slightly faster than its Commodore counterpart. For more information see the review in the June '87 issue of *Your Commodore.*

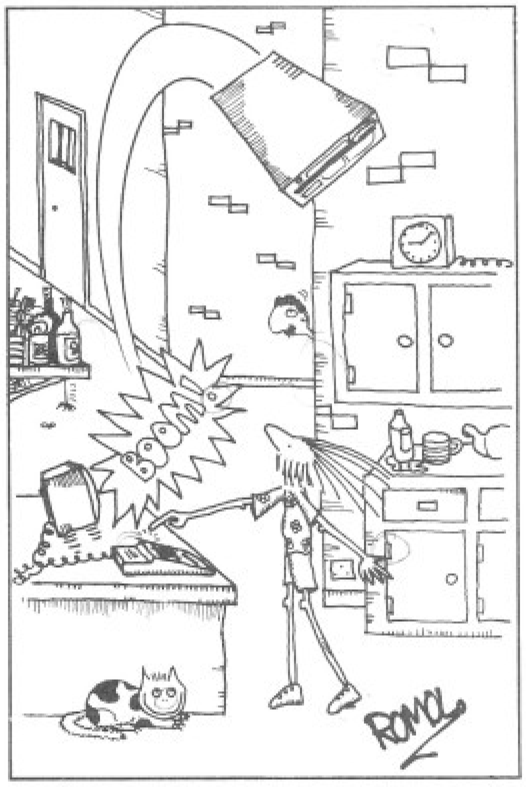
How to Enter

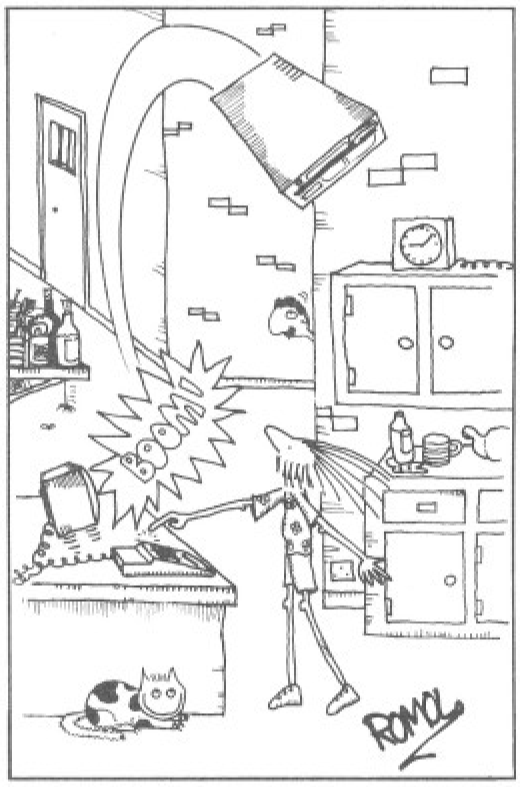
Study the two cartoons, there are a number of differences between them. Once you have decided how many differences there are complete the entry coupon and send it to the editorial address (see below). Please write the number of differences that you have found on the back of the envelope. If you don't then your entry will not be accepted.

The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Evesham Micros. This restriction also applies to employees' families and agents of the companies.

The How to Enter section forms part of the rules. The Editor's decision is final and no correspondence will be entered into.





this product. Review copy anyone?

An ICPUG gathering

On Saturday evening, after the show closed, ICPUG had a little get together in the Commodore theatre, for members and invited guests. a good time was had by all, and the free food and drink was appreciated. It was interesting talking to the folks from Commodore, who were very forthcoming, heralding what could be the start of a new era in liason and co-operation between us.

For ICPUG, at least, it was a successful show. We had lots of new

industrial microprocessors and modems, with a smattering of video stuff thrown in. I also run my own publishing company, with products currently for the 128 and Amiga. I have also written two books, one on the 64 and one on the 128.

That's me in a nutshell. Next month will be something interesting.

See you on the bit stream.

For more information on ICPUG contact:
Jack B. Cohen
Membership Secretary,
30 Brancaster Road,
Newbury Prk,
Ilford,
Essex IG2 7EP
One year's subscription to ICPUG: £10.

Ten years after the original trip to Treasure Island you're on your way back with Long John Silver as a partner! This seemed like a good idea when he told you that he'd found out that the bulk of Flint's treasure was still buried there! Now you're not so sure, after all that's happened, can you trust him?

As the game unfolds you realise that it wasn't a good idea at all as your main objective must be to survive and that isn't going to be easy. Unlike other adventures in Treasure Island, Jim Hawkins (that's you) must eat and drink regularly otherwise you'll run out of energy and die leaving all the booty to Long John Silver. If that wasn't enough you're limited to what you can carry and must type in either RUN, WALK, WADE or SWIM to move anywhere.

The daft thing is that if you happen to walk into water you flounder around and climb out exactly where you don't want to be but if you wade you're OK. Why can't you walk or run and then automatically wade if you hit water and swim if it's too deep? It might actually make the game playable.

For example, the ... broken which you ... from the stores (... hurry as the back ... running out. Onc ... engines, flip on th ... the scanner and f...

I found the ... uncontrolled mov... action as it hurtle... alarming rate that ... shame as there's ...

Touchline:

Title: *Rasterscan...* 6880. ***Machine:*** C... ***Playability:*** *4/10.*

The ICPUG Column

The second column in a regular series of ICPUG – Britain's biggest independent Commodore user group. This month – Jim Butterfield is in town!.

By Tim Arnot

Jim Butterfield is probably the most respected man anywhere in Commodore circles. ICPUG invited him over from Canada for the Commodore show last month, and put him to work, touring some of our 60 odd regional groups. This time around he managed to visit the groups at Basingstoke, Solent, Leicester and the South East.

The main reason for Jim's visit was, of course, the Commodore Show, and he was to be found on our stand among other places, answering questions and talking to visitors. We also held 'question and answer' seminars in the show theatre, where Jim held a central position among our panel of 'experts'.

ICPUG had a double-sized stand at the show, on the lower level, sandwiched between the noisy bit and the cheap disks scrummage (5.25" were going for 25p each, and 3.5" for 72p each!!). The exhibitors on the two stands opposite us didn't turn up, so it didn't take long for us to fill the extra space!

My personal opinion of the show was not one of new innovative products. I only found three products that grabbed me, but the show was well-attended, showing the lack of faith of some exhibitors to be completely unfounded. The Amiga in all its guises played a very prominant part, reducing the 64 very much to a supporting role. I believe this is a sign of things to come (after a little price adjustment), and old-timers who remember this event as being the 'PET show', will soon refer to it as the 'Amiga show'.

OK, my three top products: Eidersoft have a new 3.5" external Amiga drive for only £99 + VAT – extremely small and very neat. One or two people had a Mitsubishi colour printer for £6,000 – more colours than you care to imagine on A3 paper, and there's a cheap model at only four grand! Wordperfect was the software product that caught my eye. It does footnotes, tables of contents, indexing, paragraph numbering, macros, has a thesaurus and 115,000 word dictionary, etc, etc. As I am both a writer and publisher, I could really use this product. Review copy anyone?

An ICPUG gathering

On Saturday evening, after the show closed, ICPUG had a little get together in the Commodore theatre, for members and invited guests. a good time was had by all, and the free food and drink was appreciated. It was interesting talking to the folks from Commodore, who were very forthcoming, heralding what could be the start of a new era in liason and co-operation between us.

For ICPUG, at least, it was a successful show. We had lots of new members, and lots of good publicity. Anybody who joined the group at the show received a free ICPUG pen (wow!). We are now looking forward to the PCW show in September.

For your information...

Last month I said that I would explain who I am and what I'm doing writing this. OK, I have two jobs within ICPUG. One is as the PCompatibles library orgainiser (for the Commodore PC and other clones), the other is as editor of the ICPUG area on Compunet. In real life, I am trained as an electronics engineer, specialising in industrial microprocessors and modems, with a smattering of video stuff thrown in. I also run my own publishing company, with products currently for the 128 and Amiga. I have also written two books, one on the 64 and one on the 128.

That's me in a nutshell. Next month will be something interesting.

See you on the bit stream.

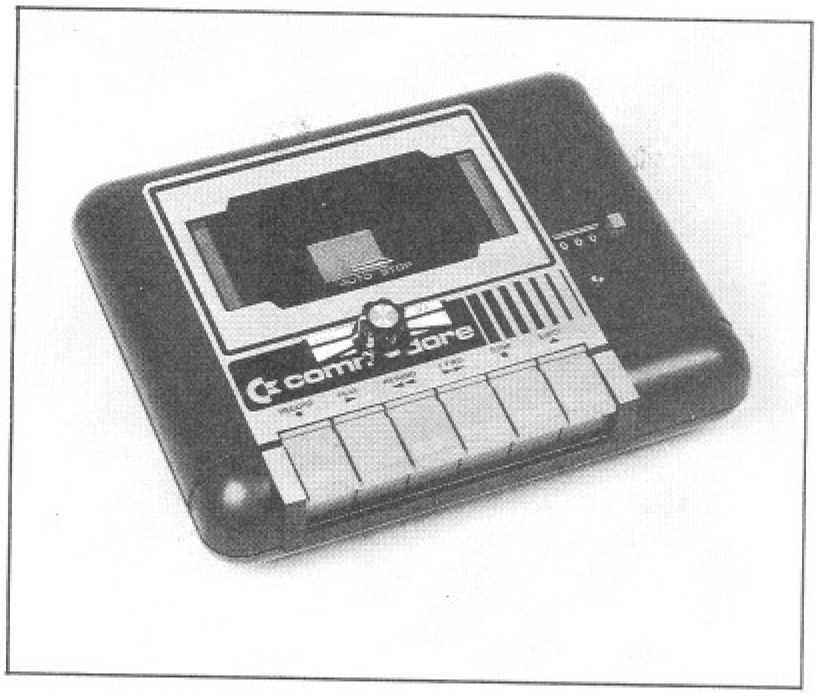
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Load-It

Tony Hetherington takes you through a new package which will hopefully put an end to frustrating loading problems.

Picture the scene. You've just arrived home with the latest mega game and you rush to your computer to try it, but it doesn't LOAD. You try it on a friend's recorder and it works! Try it on your own again and it still won't work. Feeling disgruntled, you return it to a shop to be supplied with a replacement that seems to have the same 'fault'. What can you do? You've wasted hours and you still can't play the game. Buying a disk drive is one answer but Solihul based 'Load-it' have a cheaper solution.

When a computer program is recorded on a tape it is stored in a thin band on a relatively wide tape. Your datassette then tries to read it but if the tape has run slightly out of line during recording, your tape head will miss the data track. The same will also happen if the tape is recorded properly but the datasette's head is out of alignment. If this is happening, then chances are you won't be able to LOAD anything.



The Solution

The answer is simply to adjust the head alignment screw that's just above the REWIND key on the datassette. LOAD-IT appreciate that only a few people will have the confidence to do this and risk messing up the alignment that worked for all their other tapes. To get around this reticence and make the whole process of head alignment a lot easier, a modification package has been produced that includes a knob that when fitted, can turn the head up to 180 degrees and a piezo electric speaker so that you can hear the tape load and adjust the knob to get the clearest signal.

Package to Suit You

The package comes in two formats and at two different prices. For £9.95 you get a kit with short but clear instructions explaining how to fit the knob in place of the existing aligning screw. Solder the speakers' two connections and cut a small slot in the datassettes case so that the knob can move when the PLAY button is pressed and finally add a small calibrated scale so you can note down the setting that works for each tape. If you don't think you could manage this you can send off your datassette and LOAD-IT will do it for you for £19.95.

But Does it Work?

That's the theory, but does it work? To test it I tried to LOAD a selection of tapes that included readers submission and game tapes that I 'knew' didn't LOAD. It worked! All but one loaded and the exception was a tape that turned out to be creased. Not even this can LOAD damaged tapes.

Using it couldn't be easier, as all you have to do is try to LOAD the tape and adjust the knob until you get the clearest signal. I then wrote the setting on the cassette label for later use and sat back to play the game, happy in the knowledge that my loading problems were over.

Touchline:
Title: *LOAD-IT.* ***Supplier:*** *Load-It, 35 Stretton Road, Shirley, Solihull, West Midlands, B90 2RX.* ***Tel:*** *021-745 4970.* ***Machines:*** *C64, C16 Datasettes.* ***Prices:*** *£19.95 fitted, £9.95.*

Mini Office II



6 powerful home and business programs in just ONE package – at a price that simply can't be matched!

It's a brilliant introduction to business computing. The only fault I can find is that it's just too generous for the price – Database could have sold it for a lot more. It makes some of its over-priced competitors hang their heads in shame.
– *Commodore User*

'This package is incredible value'
– Daily Mail Home Computing Guide

Outstanding value for money . . . If you want to use your 64 as a highly efficient office machine, Mini Office certainly gives you the power you need.
– CCI

Voted Business Program of the Year – 1985 *AND* 1986
Pop. Computing Weekly

WORD PROCESSOR
Compose a letter, set the print-out options using embedded commands or menus, use the mail merge facility to produce personalised circulars – and more!

SPREADSHEET
Prepare budgets or tables, total columns or rows with ease, copy formulae absolutely or relatively, move directly to a specific location, recalculate automatically – and more!

GRAPHICS
Enter data directly or load data from the spreadsheet, produce pie charts, display bar charts side by side or stacked, overlay line graphs – and more!

DATABASE
Build up a versatile card index, use the flexible print-out routine, do powerful multi-field sorting, perform all arithmetic functions, link with the word processor – and more!

COMMS MODULE
Using a modem you can access services such as MicroLink and book rail or theatre tickets, send electronic mail, telex and telemessages in a flash – and more!

LABEL PRINTER
Design the layout of a label with the easy-to-use editor, select label size and sheet format, read in database files, print out in any quantity – and more!

ORDER FORM

Please send me Mini Office II for the Commodore 64/128

☐ £16.95 cassette
☐ £19.95 5¼" disc

I enclose cheque made payable to Database Software, or debit my Access/Visa card:

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Exp. date ☐

Signed ....

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Address ....

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ORDER HOTLINE:
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AO38

DATABASE SOFTWARE

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Hazel Grove, Stockport SK7 5NY

Fantasy Games

If your flights of fantasy lead you to imagine heroic quests for lost treasure or battles with monsters and demons, then stop thinking and start playing, as your C64 can quench your thirst for adventure.

By Tony Hetherington

Our history is littered with tales of such heroes and damsel-eating monsters just waiting to be slain. The Welsh flag features a dragon, the Irish talk of the little people and the English patron Saint is best known for slaying a dragon. And if you ask any Scot what lurks bneneath the misty waters of Loch Ness they'll reply 'the monster!'

With such heritage it's understandable that within us all there's a buckle waiting to be swashed and a hearty laugh to be heard. So gather your swords and spells for we travel in search of monsters, magic and treasure!

The search for adventure will inevitably lead to adventure games, but it doesn't stop there as the computer hero can fight for fame and fortune (and his life) in a series of role playing games, coin-op conversions, arcade games and even some strategy games! Whatever your taste in games you'll be able to taste adventure.

The adventure games were first into the fray with the classic Zork trilogy from the equally impressive Infocom. Does anyone know a bad Infocom adventure? The quality of the text descriptions, the puzzles that are set and the packaging packed full of clues and red herrings is second to none. Much has been said about Zork I, II, and III as well as the sequel trilogy Enchanter, Sorcerer and the recent Spellbreaker, and I'll just add that if you enjoy good adventures that really challenge you and you have never played an Infocom, where have you been? Climb out of your Outer Mongolian cave, get a disk drive and get adventuring.

Meanwhile back on this side of the pond, Melbourne House were making the headlines with an adventure version of Tolkien's Hobbit. Although the game attracted (justified) rave reviews such as 'You can actually talk to the characters' most of the headlines weren't about the game itself but about the growing speculation about a followup game based on the Lord of the Rings.

In 1985 the first part of the trilogy appeared which was followed recently by part two, The Shadows of Mordor. As in part one the Shadows of Mordor are based on a book in Tolkein's classic trilogy, this time The Twin Towers. It finds our Hobbit heroes once again alone and in trouble as they attempt to cross the desolute wastelands, survive the evil mountains until finally they reach Sauron's homeland and the third and final part.

The Jewels of Darkness is another classic adventure trilogy and consists of three early, and for my money the best, Level 9 adventures bundled together, improved and repackaged by Rainbird for £14.95. This treatment of Colossal, Adventure and Dungeon Adventures obviously impressed the wizards of Level 9 as they are now adding the final touches to Knight Orc which promises to be even better.

If you mention Rainbird you must also mention the Pawn. Written by Magnetic Scrolls this superb adventure has become the new standard by which others will be judged. The Pawn isn't actually a fantasy game although there is a wizard in it, but it is the prequel to The Guild Of Thieves which is already a must for Amiga adventurers and due to appear on the C64 in a few weeks.

The game revolves around your attempts to qualify as a member of Reknaught's Raiders by becoming an accomplished thief. To test your mettle as well as your skill, determination, puzzle solving and general thieving abilities, you're given a test in which you are dropped on an island and told not to come back until you've given a test in which you are dropped on an island and told not to come back until you've got all the booty. Some is easy to find such as a chalice that's sitting in plain view. Unfortunately it's also guarded by an equally visible grizzly bear! Other problems aren't so easy and half your time you're left wondering what's important and what isn't.

Despite the fiendish problems and incredible text, there's actually space left on the disk for some of the best adventure graphics you are likely to see. Better than the Pawn. If you don't believe me then track down a copy when it's released and see for yourself.

Value for Money?

Adventures such as the Guild of Thieves and the Infocom games are superb value for money but won't leave you much change out of £20. Mastertronic's Spellbound offers an ingenious plot, window menus and animation for only £2.00! You star in the game as Magic Knight who has been transported to the mythical castle of Kahn by a misfired spell cast by your friend Gimbel the wizard while he was trying to improve the flavour of his rice pudding. Now you have to solve the mysteries of the castle, it's objects and it's banshee so you can return home, but only when you've discovered



Spellbound

how to get through a darkened room full of inflammable gas and over an unclimbable wall.

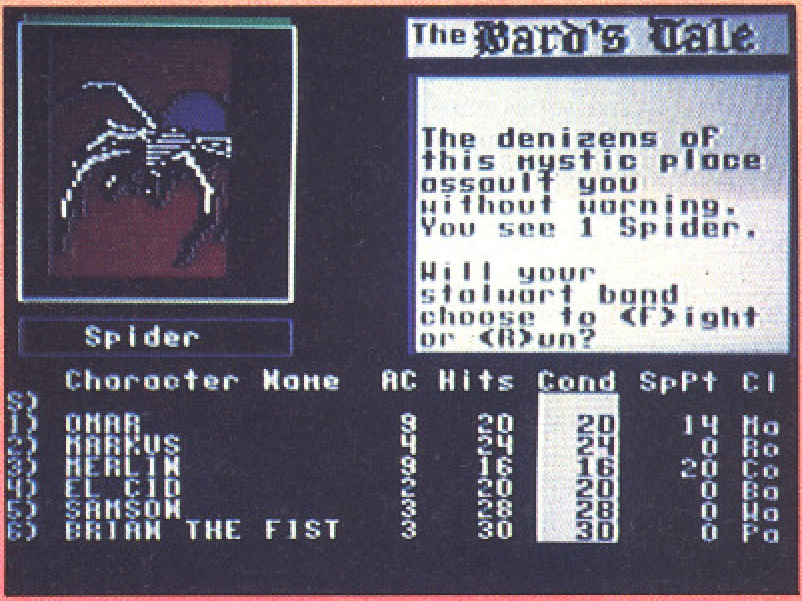
Role Play Your Adventures

Fantasy gaming isn't just adventuring as role playing games such as Dungeons and Dragons and Runequest have proved. Software has tried to match the depth and excitement of steering a party through these games with a succession of games such as Ultima IV, The Shard of Spring, Phantasie I and II, Master of Magic and The Bard's Tale.

The fantasy role playing adventures split into two groups; those that show a party moving around a wilderness and it's dungeons and castles, and those that show a 3D view of the corridor or room that you're in. They both have one thing in common, they take a long time to play, sometimes over 100 hours!

'When the going gets tough, the bard goes drinking' is the motto of Ariolasoft's (Electronic Arts) superb Bard's Tale. The evil wizard Mangar has the town of Skara Brae in an icy grip. Under an eternal winter spell nothing moves in comfort except perhaps the monsters that control the streets of the town and the dungeons that lie below them.

As soon as the brave bard has quaffed an ale and raised a party of fellow adventurers he'll set off and tackle the 128 different monsters that populate the taverns, temples, towners and turrents of the town and seek the 85 magic spells and that they will use in the 16 levels of dungeons. All in 3D!

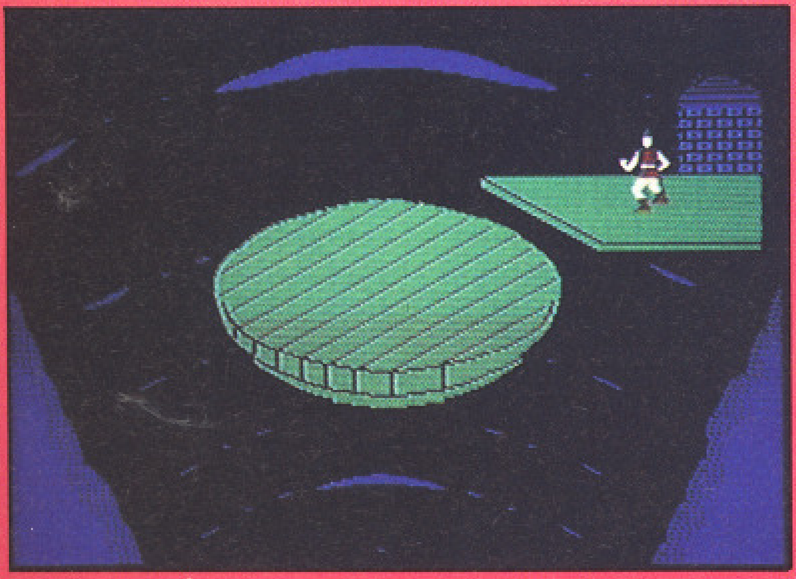


Bards Tale

3D Vision

If you think the Bard's Tale sounds challenging then why not try Alternate Reality. It also features 3D views of the city, that you have been abducted and brought to as well as the insides of Inns to eat, drink and hear gossip, shops to buy armour, weapons and supplies and even a bank to store your booty.

Nothing too surprising there, but wait, this is alternate Reality – part one. Once you've explored the city in part one your ready to delve into the Dungeon, await the challenge of the Arena, explore The Palace and survive the Wilderness before reaching the Revelation and finally reach your Destiny in the seventh and final part!



Dragons Lair



Druid

The king of the wilderness roleplaying adventures is undoubtably Ultima IV. The graphics may be primitive but the atmosphere is piled on thick. For example, instead of rolling dice to decide your characteristics, a fortune teller turns cards and asks you questions. Your answers form your character. Then it's out into a massive world of cities and dungeons and your quest to become the Avatar, the pinnacle of bravery and virtue to lead the land of Britannia into a new era.

Anyone who has played Exodus Ultima III will know that this isn't going to be easy but will be amazed by the fact the Ultima IV is sixteen times bigger than III! Thanks to Microprose who has now set up a UK operation and a deal with Origin (the Ultima authors) you will soon be able to play Ultima I and II as well as the forthcoming Ultima V.

The Ultima series may be the best but they've got stiff competition from games that are getting better and better. SSI games Shard of Spring and Rings of Zilfin were covered by the recent article Warlocks and Wargames and have now been joined by two more, Wizard's Crown and Phantasie II.

In Wizard's Crown you mount an expedition of eight characters to regain the stolen Crown of the Emperor. These brave adventurers include sorcerers, priests, fighters, rangers and thieves that are defined by an incredible number of factors that include their ability to haggle, scan, picklocks and swim.

The game itself features the most complicated and most accurate combat system you will find in a role playing game giving each character and critter a bewildering number of options every combat turns including a choice of offensive and defensive spells.

Meanwhile the Dark Lord Nickademus has fashioned an evil orb to enslave the people of the beautiful island of Fennorah. Undaunted by the task ahead you lead a party of brave monks, priests, wizards rangers, thieves and fighters through the dark wilderness, dank dungeons and then onto the Astral plane and the Netherworld as you tackle the quest set in Phantasie II.

This is of course the sequel to Phantasie and you can even use your surviving party from the original in this sequel. Newcomers can raise a new band of adventurers but I'd suggest they travelled through Phantasie before tackling this quest. Coming soon, Phantasie III!

Economy Role Players

For computer role players with a budget, who want maximum value for money, they should look no further than Mastertronic's Master of Magic. This marvellous program was written by Richard Darling (who has gone on to form Code Masters) and features the music of Rob Hubbard.

Using duck shoot menus to select your commands you must cast your magic missile, fireball, energy drain and magical shield spells with care and collect any scrolls, shields, armour and weapons you can find from your slain victims until you can complete your quest and retrieve the amulet of immortaility that is lost in the underground caverns. Return this to the Wizard Thelric and escape from the underworld.

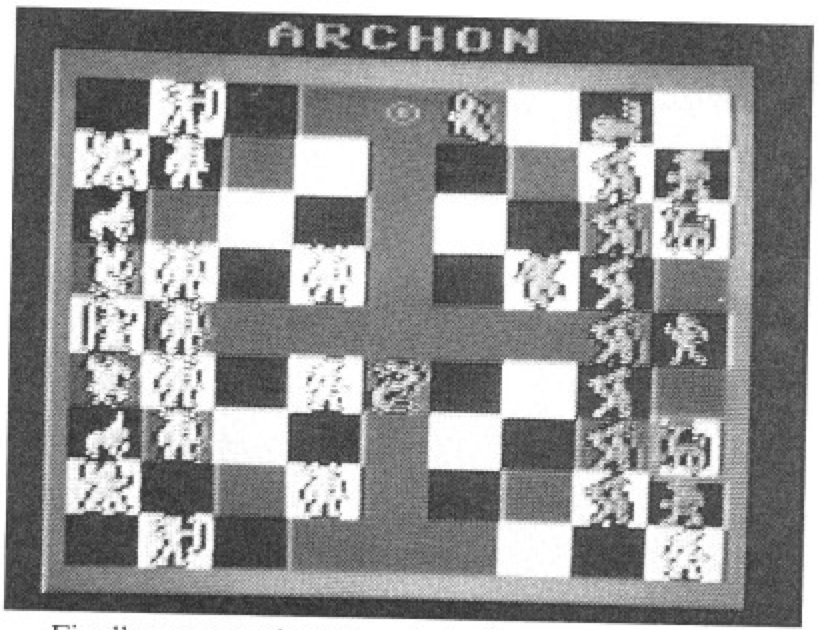
Even the coin-op machines are spellbound by fantasy gaming and in a growing number of coin-op conversions that you can now get for your C64. The best known of these conversions is of course Gauntlet which brings fast shoot 'em up action to a world full of grunts, ghosts, sorcerers, death and lobbers. 512 levels of monsters, traps, treasure and magical potions await our brave adventurers that can enter on their own or with a friendly warrior, elf, wizard or valkerie.

Dragon's Lair was thought to be the coin-op machine that couldn't be converted but the cynics were wrong, as Software Projects produced the C64 versions of the video disk screens in Dragon's Lair and Escape of Singe's castle. Incredibly, the action is all there as the heroic Dirk the Daring risks plummeting disks, rapids and whirlpools, mud monsters, giant boulders and Singe the dragon himself to rescue the fair Princess Daphne.

Druid, Ranarama and Wizard form a trio of games that show the variety of fantastic arcade games that you can get for your C64. Druid was labelled a Gauntlet clone when it was first released. It wasn't long before players realised it was a completely different game and worthy of a *Your Commodore* Game of the Month accolade. The combination of Gauntlet style graphics, the need to fight off the continuous onslaught of beetles, ghosts and critters while finding fresh supplies of spells and keys ensured a chart topping success for Firebird.

Wizard (Ariolasoft) added a new dimension to platform games by casting you as a wizard who could gain spells from collecting keys and use them against the screens critters to complete each level.

Hewson's Ranarama gives you a tricky situation. You've turned yourself into a frog as the warlocks invaded, and now he must hop around an eight level dungon, fight the warlocks and gain their ruins to create better spells to repel the invasion and return himself to his former glory. A nice balance between arcade reactions and strategic planning are required to complete this one.



Finally, not even hard line strategists can escape as one of the best strategy games of all time is a chess variant called Archon (Electronic Arts). This is no ordinary chess game as each piece is a mythical creature joined in battle as light fights darkness. An army of unicorns, knights, archers and a phoenix stand by the wizard against the dark forces of goblins, manticores basilisks and dragon's led by the evil Sorceress. Each piece has it's own unique way of moving, strengths and weaknesses that come into a play when one piece tries to take another, as in Archon, if you want to take a square you have to fight for it in a seperate combat screen!

YC

Letters

If there's anything you want to know or anything you want to say, just write to this page and we'll try to oblige. Plus, a Your Commodore binder for the star letter.

Write to us!

I think *Your Commodore* is very good and the layout excellent. However, I do feel that you would increase your circulation a lot more if you enlarged the Letters section, say to two or three pages, to deal with all aspects of Commodore computing and to give solutions to problems encountered by your readers.

I hope that you don't mind the criticism.

Kevin Williams,
Great Yarmouth

Of course we don't mind readers commenting upon the magazine – how else would we know what you want to see within the pages of Your Commodore? In fact, we would like to have more suggestions from readers as to what they would like to see in the magazine. We can't promise to provide everything but we can try!

We agree with your comments about readers' letters – we'd love to be able to print more. The only problem is that most of our mail tends to be extremely specific, such as queries about a particular line in a particular program. So readers – the ball's in your court – to encourage you to write more publishable letters, we are now offering a FREE Your Commodore binder for what we think is the star letter. So get to it, get those letters flooding in, we're waiting to print them.

Oh, by the way, Kevin, since you want to see more letters and aren't frightened to say so – a complimentary binder is on its way.

Star Letter
Plus/4 Praise

Thank you for the support that you are giving to the Plus /4 computer. May I help to clear up some popular misconceptions regarding this Cinderella machine?

Many readers may understandably think that the Plus /4 is little more than a deluxe C16, simply because C16 software is advertised for use on both machines.

This association with a more limited machine has been unfortunate for the Plus /4 which is blessed with a full 60671 bytes free (please excuse the dig at the C64!). It also possesses dual-tasking capability, given the right software.

Since the Plus/4 was reduced from its original £300+, to around £50, the number of users has increased dramatically — I now have two, and no regrets!

The Plus/4 can use the 1551 drive as well as the venerable 1541, but the 1551 has the advantage that it operates in parallel and is therefore very fast. They are also being sold at giveaway prices — I paid £200 for two! Coupled with two ex-Reuters green-screen monitors, a second-hand DPS 1101 daisywheel printer, and my trusty MPS 801, modified to give it true descenders. All this, which resembles the command module of the Starship Enterprise, cost less than £700, and provides me with a work station more than adequate for my purpose, the collection and management of several thousands of genealogical (family tree) records.

Until fairly recently, we Plus/4 types have been at a considerable disadvantage in the software field. True, we have our built-in software. This is of doubtful usefulness though it fortunately doesn't interfere with memory, and is easily removable if desired. The situation has now, however, improved enormously, for Precision Software has released Version 2 of Superbase and Script Plus, a word processor program which I rate higher than Easy Script on the C64.

Not to be outdone by Precision, Impex Software has recently produced a fairly comprehensive accounting system for the Plus/4, entitled "Company Pac 1.2.3" (why didn't it include a spreadsheet?). Although not needing this program , I purchased it simply to support their effort.

The future then for Plus/4 owners is looking much brighter, user group clubs are starting up, and I see that we are now catered for on the modem front.

We could do with better support from the hardware manufacturers. I am approaching the point when I could use a hard disk system, but unfortunately I am not aware of one which is compatible. Perhaps someone out there can help?

Denys Coppard,
Wymondham, Norfolk

Your Commodore aims to support the whole range of Commodore home computers. It's nice to know that our efforts are appreciated.

It's probably worth pointing out to our readers that most programs for the C16 will also work on the Plus/4 without any problems. Should you have a RAM expansion for your C16 then most of the Plus/4 programs will work on the C16. We would suggest that any C16 readers consider purchasing one of the many RAM expansions that are available since the extra memory will allow them access to a much larger software base than that for just the C16.

I am afraid that no one in the office is aware of a hard disk for the Plus/4. If anyone else out there is aware of one, then please write to Mr Coppard, c/o Your Commodore, and we will pass it on.

Printing Problems

I own a C64 and an Alphacom 42 printer. Unfortunately I do not have the necessary interface to connect them together. My enquiries have reaved that the printer manufacturer's probably no longer trading and I have been unable to locate a trader who can help me.

Any assistance that you could give me towards acquiring the correct interface would be greatly appreciated.

P.J. Bonsall,
Marlow, Bucks

I am afraid that even though we are aware of the Alphacom printer in the office, no one has ever come across one in the flesh. We are therefore unable to suggest an interface since we don't know what connections the printer has. Perhaps some of our readers will have come across this beastie and can inform Mr Bonsall of what he will require to get his printer talking to his C64. If you can then write to P.J. Bonsall, c/o Your Commodore and we will pass it on.

Educating the Plus/4

As a new reader of your Commodore I am writing to ask if you can recommend any educational software suitable for pre-school or early school age children dealing with spelling and maths. We own a Commodore Plus/4.

Could you also recommend a source of supply for any titles you recommend as I have yet to find a shop that sells this type of program in the local area.

Bill Baldry,
Huntingdon, Cambs

As the earlier letter from Denys Coppard states, the Commodore Plus/4 has always suffered from a lack of software of any kind. Only over recent months has software become readily available.

Here at Your Commodore we have never received any educational software for the Plus/4 or even the C16. If there is anything out there, then I'm sure some other reader will know and will let Mr Baldry know, c/o Your Commodore.

If you've written educational software for these machines we would of course be delighted to take a look at it with the view to publishing it in a future issue of Your Commodore.

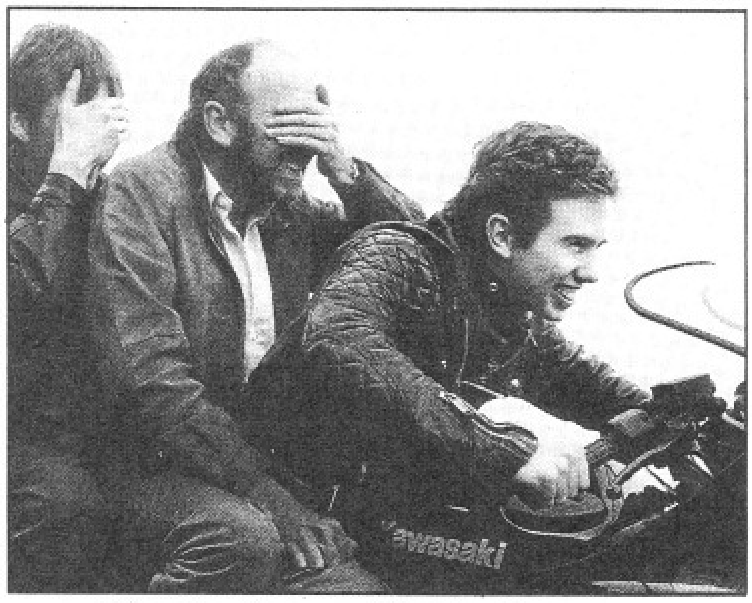
YC

Caption Winners

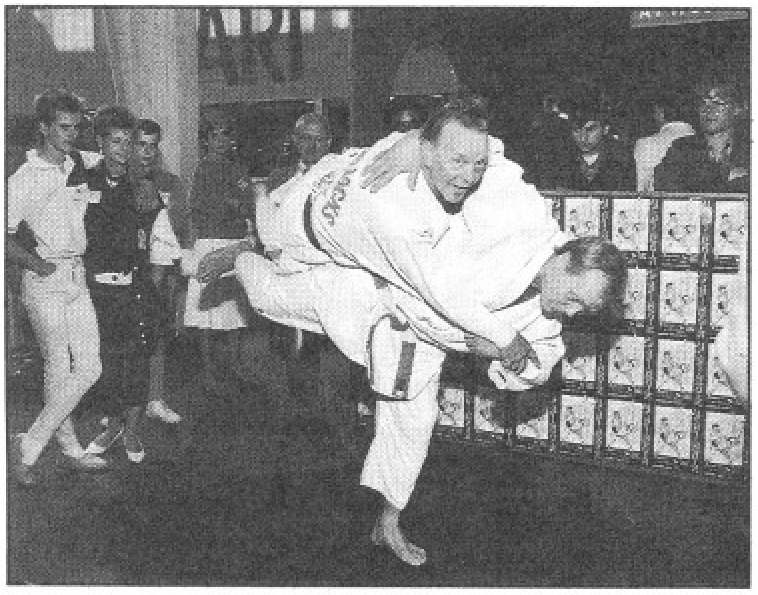
Have you sent a caption in for one of our competitions? Could you have won a fiver? Check below, if your name is there your prize is on its way.



Brian Clough - Football Fortunes.
"No, you can't 'ave it back"
From: **David Fairweather, Darwen, Lancs.**



The Darlings — Codemasters
"Get us to the hospital fast! We've both got terrible headaches"
From: **Chris Gair, Harlow, Essex.**



Brian Jacks
"There must be an easier way to get my jacket off" From: **Sean Kingston, Stratford Upon-Avon.**



Amada Barry - Ariolasoft
"I've 'eard of raining cats and dogs, but this is ridiculous"
From: **Robert Mosquera, Epsom, Surrey.**

SUMMER SALE

PLEASE READ THIS

WHOLESALE PRICES TO YOU THE USER

★ BUY 5.25" DISKS

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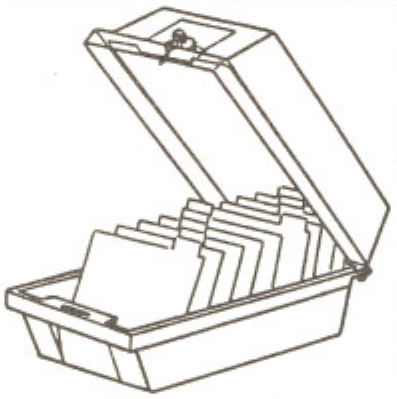
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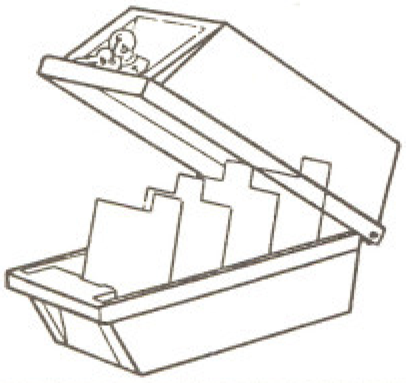
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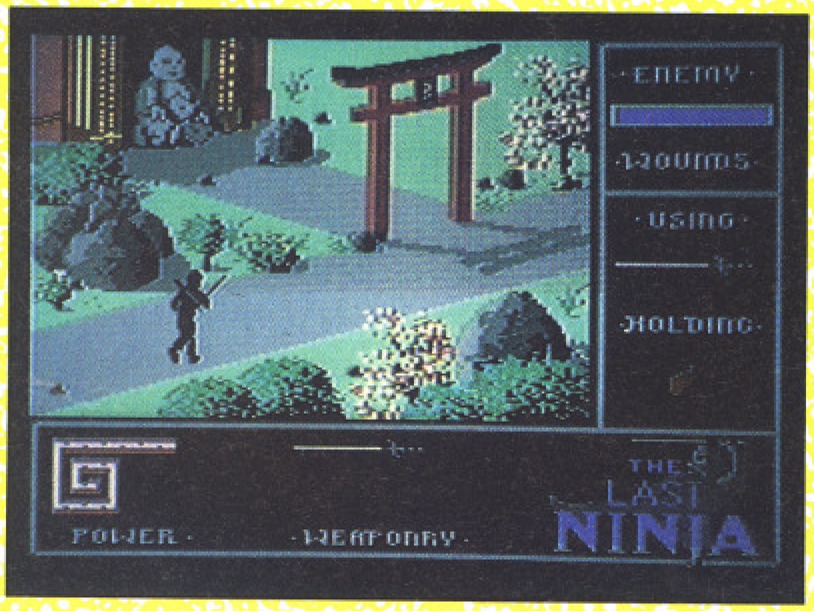
The Last Ninja

After Way of the Exploding Fist, which started the Kung-Fu craze, we all wondered where it would end. System 3's Last Ninja is the answer - nothing can possibly beat this Kung Fu King.

The Last Ninja isn't the first game to try and expand the basic 'beat 'em up' format into an arcade adventure but this is the only one which keeps the action at fever pitch and features stunning graphics that have only been previously seen in static adventures such as The Pawn. In the Last Ninja some of these are animated and form the back cloth for some bone-crunching battles.

You play Armakuni who was left as The Last Ninja when the rest of the brotherhood were ambushed at their teachings on the island of Lin Fen, by the dark forces summoned by the evil Shogun Kunitoka. You have sworn to seek revenge of this Shogun and his false Ninja's that are now being trained on the despoiled island.

To complete your quest you must fight your way through the six areas of the island until you come face to face with the Shogun in his palace. In each stage you will have to fight the Shogun's Ninja's that are armed with a variety of weapons which you can also use, if you can find them hidden in the undergrowth. You will find temples and fountains of knowledge and be given divine guidance for what to look for.



Controlling the Ninja isn't that easy as your using a complicated selection of joystick moves that have different results depending on which weapon you're using and whether you've pressed the fire button. It's not as complicated as some games such as Rock and Wrestle but it takes some practice before you make better use of your three lives.

It's a fair bet that you'll lose a few lives trying to leap across the river or marsh on the first level since success depends on the correct combination of jumps. This is another acquired skill but you didn't expect it to be easy, did you?

Your quest begins in the wilderness where you must search for important weapons and useful objects as well as practice your jumping and fighting skills. After a few games you may be good enough to get past the fire breathing dragon at the end of the level and go on to enter the wastelands. Survive the wastelands and cross the Lin Fen mountains to the Palace Gardens, and then it's through the dungeons to the palace (lower level) until a final confrontation in the Inner Sanctum.

The graphics are superb and I can assure you that the standard is maintained throughout the game. However, that is only half the story. The Last Ninja features some fiendishly difficult logic problems, such as how do you get past the dragon without getting fried and one of the most realistic combat systems seen in a game where the damage inflicted by a blow not only depends on the weapon used but also where you hit him. So a chop to the head with a sword will do considerably more damage that a kick in the stomach.

The last Ninja is quite simply the last word in combat games.

T.H.

Touchline:
Name: *The Last Ninja.* ***Supplier:*** *System 3.* ***Machine:*** *C64.* ***Price:*** *£9.95.* ***Originality:*** *9/10.* ***Playability:*** *10/10.* ***Graphics:*** *10/10.* ***Value:*** *10/10.*

Code Masters

We take a look at Codemasters' software which is renowned for its high standards.

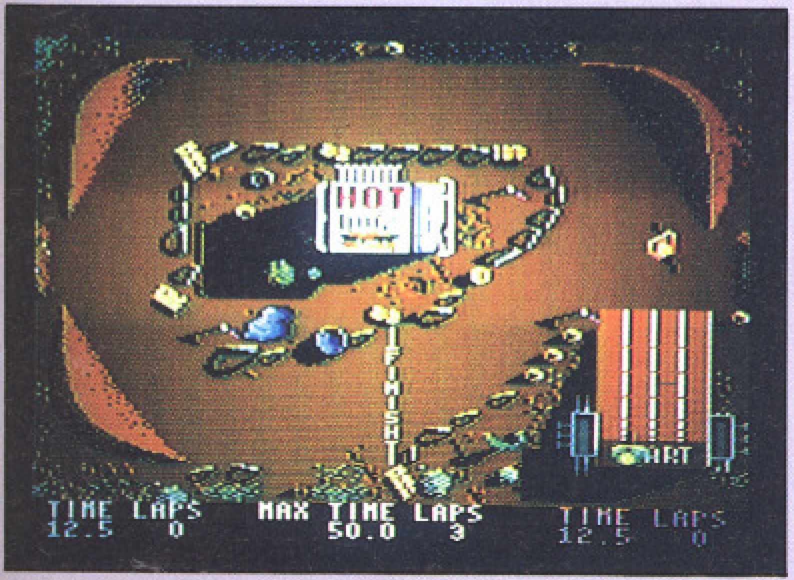
By Tony Hetherington

Code Masters launched its range of £1.99 budget games just seven months ago last November, at the time of the great budget bonanza. Software giants like US Gold launched their own American budget games so there surely wasn't room for a newcomer. There was, and now Code Masters boasts Gallup figures that make it the number two budget software house and claim it's hot on the heels of the leader Mastertronic.

The Code Masters story began four years ago with a company called Galactic Software that was formed by David and Richard Darling to sell their own mail order VIC-20 games. This went remarkably well and soon they were writing games for other software houses on other machines such as Master of Magic and BMX Simulator for Mastertronic and the Mirrorsoft Games Creator. In November 1986, Richard and David were joined by Jim Darling (their father) and subsequently formed Code Masters.

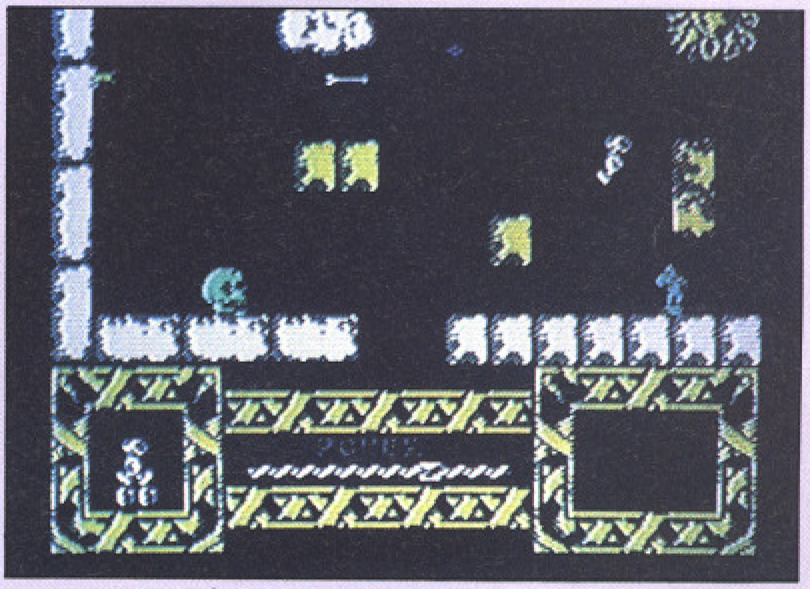
The current Code Masters collection contains ten games for the C64 that includes eight fast action arcade games, an adventure and the release of the Games Creator.

BMX Simulator



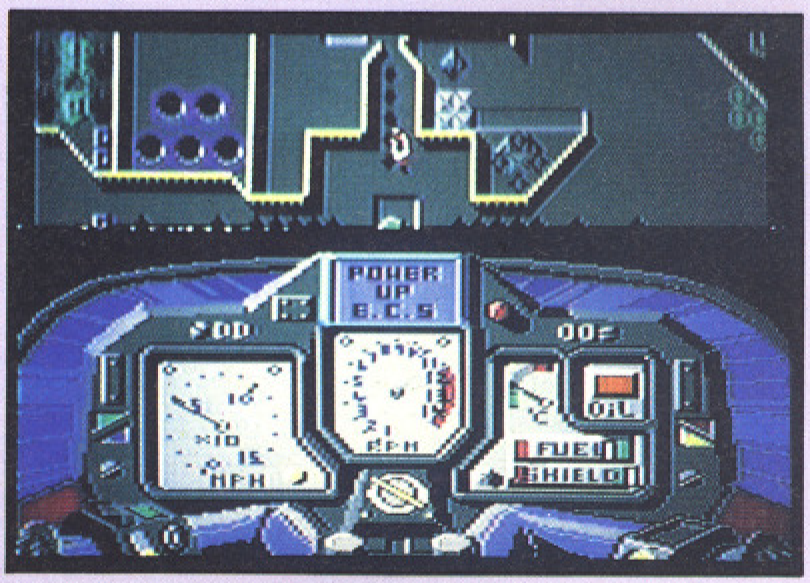
This is the all action sequal to BMX Racers and is the toughest BMX challenge you'll face. Using joystick power instead of pedal power you must race around seven courses packed with bumps, ramps, hills and different surfaces, either against the clock or against the computer or a friend. The fun really starts in a two player game as the top down view shows the action as you burn up the tyres and your opponent.

Vampire



A fiendishly difficult arcade adventure set in the 95 eerie rooms of Dracula's castle. You play Brok the Brave who has sworn to kill the evil Count who still stalks the world in the year 2987! Now you must guide Brok through the ramps and rooms of the castle avoiding the chasms and critters that await a mistimed jump.

Red Max



The sequel to the superb Last V8, only this time you're riding a superbike as you attempt to save the Astroworld from certain destruction. The game begins as you awake to find that the Renegade Lords have sabotaged the ship and now you have to save it. This isn't going to be easy as you must drive around the bike crunching landscape to deactivate 27 fission mines before descending to the engineering level to power up eight back up cooling systems, shut down four power plants and finally wake the crew in the hibernation centre!

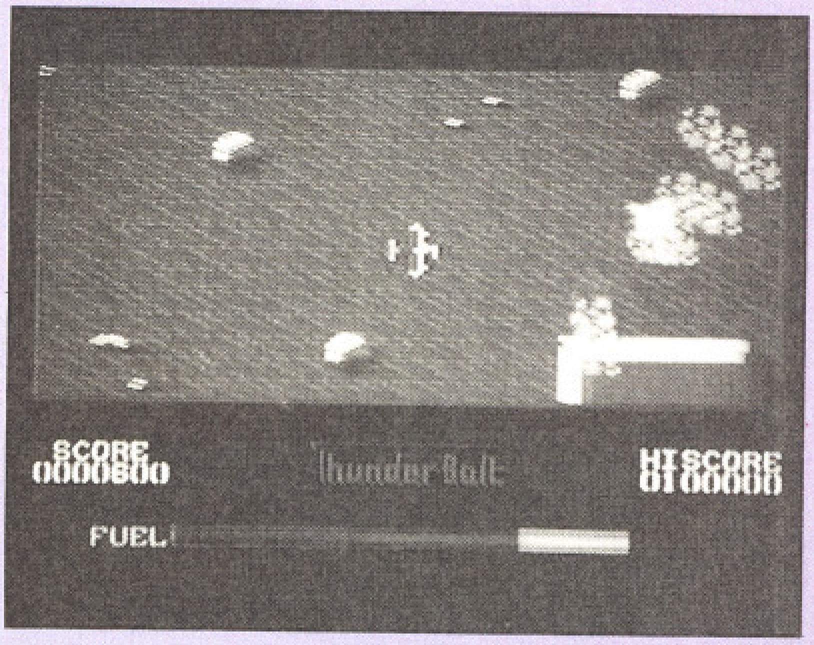
Super Robin Hood

Robin Hood is back in Super Robin Hood in my favourite Code Masters game. It's an excellent animated platform game in which Robin must battle his way past crossbows firing, guards, find keys to operate ancient lifts and collect enough heart symbols to save Maid Marion. The action is fast and furious and so smooth. If you like platform games you'll love this one.

Mr Angry

This nearly got Code Masters into trouble with the supposed similarity between the game and the character on Radio One's Steve Wright show. The game features your attempts to get a picture of a glamour model staying somewhere in the hotel. First you must collect your camera, flash and press pass before you're ready to get the picture. Unfortunately, the hotel staff will try and stop you as well as one of the guests, Mr Angry.

Thunderbolt



It had to happen sooner or later. Both sides in the war between Earth and Proxima had developed the chronoclasm bomb that could not only destroy things but things that had been and things that were about to be. It was inevitably used ripping the space time continuum over Europe mixing ten centuries of history in battle. You are Thunderbolt the pilot of an Earthonian fighter and you must destroy anything that moves until the effects of the bomb subsides and you survive until the end of the game.

The Armourdillo

Half machine, half animal, this war machine built by the besieged inhabitants of the planet Mobanti as a last chance to defeat the attacking Earthmen! This time you're out to stop us destroying your world, and ferry as many survivors as you can out of the cities to safety.

Terra Cognita

100 screens of shoot 'em up action is the world of Terra Cognita as you play a mining engineer fleeing from a warrior robot in only a small scout ship. Each screen is full of ship wrecking walls as well as time shifts that send you back to screen one (particularly annoying if you're on screen 99!) but you will also find extra fuel dumps, bonus scores, extra lives and force field generators that make you invulnerable to the constant alien onslaught, but only for a few seconds. Seven screens down, 93 to go!

Creations

If you think you can create your own game then why not try Creations which is a reincarnation of the original Games Creator complete with three sample games. Now you can define the backgrounds, sprites, sound effects, alien movements and player characteristics for your own games for only £1.99. The Games Creator was a good buy at its original full price but now it's a budget bargain.

Necris Dome

Finally, Necris Dome takes us into the world of adventure onboard the disturbing world of a giant burial spaceship that's been taken over by the rogue Archmandroid who is now training the mandroids for an attack on Earth. You're smuggled onto the ship with the next shipment of coffins to try and stop them. Will you succeed or are you just early for your funeral? These questions are answered as you delve deeper into a fascinating graphic adventure with puzzles that will challenge even the toughest adventurer.

The Next Move

Anybody who has played any of the Code Masters games will realise their tremendous success is due to the standard of their games. At times it easy to forget that they only cost £1.99 each, as many are as good, if not better, than their full-price counterparts.

That was all achieved in just seven months and already the Code Masters are planning their next move. The next move comes in the guise of Lazer-force which is to be a sequel to Thunderbolt. The game is to feature 30 main levels with bonus stages between each level and graphics showing erupting volcanoes, mutating landscapes and a giant metallic millipede. You've got just a few weeks to practice with the other games before you can sign up for the Lazer-force. YC

Talking through your RS232

There's more to this interface than meets the eye. Do not be deceived by first impressions.

By Eric Doyle

An RS232 interface is hardly the most exciting product as far as appearance is concerned. For your money all you appear to get is two connectors with a length of cable to separate them. Don't be deceived by appearances, this could be one of the most gratifying additions for your Commodore.

An RS232 is the Commodore's link with the real world via the user port, the most ignored socket on the back of any recent Commodore machine. Via this outlet you can communicate with Compunet, link up with another C64, access a wider range of printers or perform electronic wizardry with a whole series of domestic equipment.

I can already hear the muttering about the user port being RS232 and you're not wrong but the great drawback is that the Commodore implementation only provides a 0/+5V output and most true RS232 equipment requires a +/-12V supply. York Electronic Research's interface does the necessary conversion for you.

Value for Money?

For your money you also get a disk or tape which initialises the port for use and will also convert the 64 into a terminal emulator for use with a suitable modem.

It is obvious by reading the manual that the modem link and printer interface are considered to be the most important uses for the unit and the detail is sufficient to get you up and running. As far as connecting two 64s together, the detail is sketchy and a few wiring diagrams would avoid the possibility of the keen amateur blowing up two 64s in one fell swoop!

RS232 communications have a language all their own. Handshakes, baud rate, parity and duplex form the new vocabulary which not only confuses the newcomer but also has an off-putting effect on those considering modem communications. The new syntax is explained quite well in a concise way which proves that the jargon is no more than part of the rites of telecommunication.

Handshaking is a way in which one terminal tells the other that it is about

to send data and the other terminal says it is ready to receive. Baud rate is the speed at which information is transmitted. Quite often the speed of transmission can be different to the speed at which information is received. In human terms this means that one machine speaks more slowly than the other.

Parity is a check for data corruption. Anyone who has used a telephone knows how a bad line means that conversation can be difficult. This is also true in the comms world. Parity does not solve the problem but it can let you know that something is wrong. Information is sent in binary form, a string of ones and zeros in bursts of eight digits. If you're working on even parity, seven of the bits hold the information for a single character, the computer counts the number of ones in that character and if this is an odd number the eighth bit will be a one if not it will transmit a zero. The receiving terminal knows that if there is an odd number of ones in the transmitted byte something has gone wrong. Similarly 'some systems use parity based on odd numbers.

Full duplex is when both machines are able to talk simultaneously to one another and half duplex means transmission in one direction must end before the machine can receive.

The Relevant Software

The software for YER's RS232 interface supports any of these systems via a simple menu selection system. The Set Up program is mainly for use with RS232 printers and your only real concern is the baud rate. If the printer does not tell you which rate to use it will not damage the machine to experiment a little. The worst that can happen is that the printer will fail to respond.

A handy troubleshooting section should solve most of the problems with printers, but if a baud rate over 2400 is required the 64 cannot respond fast enough. Luckily most printers have switches to select various rates so all may not be lost.

Limitations

The one drawback of the Terminal Emulator is that it can't handle Viewdata/Prestel style graphics which limits your entry into the comms world slightly. Apart from this, the software menu is flexible enough for any system you'd want to talk to and cuts down the sophistication and cost of the modem required.

York Electronic Research have provided a service which to most Commodore owners never realised they required. RS232 interfacing is the subject of several books and articles which benefits a sector of users who wish to combine an interest in amateur electronics with their computer hobby. For these people YER can supply the missing link.

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The Commodore Show – June '87

This year's Commodore show was a paradise for the game user, but did the serious user find it worthwhile?

By Rory Newman

This year's Commodore show did not have the launch of the Amiga, the 64C nor the Music Expansion system, yet it was one of the most crowded ever. The reason – software – very cheap software.

The crowds were not surrounding the Amiga stands, gasping at the Blitter chips capabilities, and thinking that the Amiga would be the next thing, but crowding around the benches, with boxes and trays of games from 50p upwards, gasping at the bargains and thinking that they'd never had it so good.

More and more people are getting the message that the Commodore show offers amazing software bargains, not only hardware ones, often in excess of £200. Companies such as Sheklana, Twillstar Computers, JB Software and Trybridge were reporting the highest turnovers, not Commodore and the other assorted hardware suppliers.

Many software companies were there, but mainly the smaller independent ones, and although this is a good sign, showing us that they are still around, and that we have a choice, most of the major houses were conspicuous by their absence.

The much neglected and very much underated C16 had two of the main three software houses there in the shape of Anco and Tynesoft. Anco, very much a major force still, after many years, starting way back with the VIC 20, were shoeing off Summer Events, Udo Gertz's long awaited sequel to the quality of Impossible Mission on the 64.

This was selling like hot cakes, as was Terra Nova, a scrolling shoot-em-up of the highest quality, which like Summer Events featured speech.

Tynesoft, the Newcastle based house were showing off Phantoms, a one player gauntlet variant which I recently awarded a Gamer Gold and Spy vs Spy, which they've acquired the C16 rights to and produced a faithful copy. The other main C16 Producer, Gremlin was, like so many others absent. We are still waiting for Thing on the C16 and it would have been nice to have seen Thing Bounces Back, Rebounder, and their promised Amiga products.

Where Were They?

Imagine weren't there to show us Army moves or their conversion of Taito's excellent coin-op, Slapfight. Imagine's controlling house. Ocean weren't there either, so we didn't get a glimpse of Tai-pan, Head Over Heels or their much praised Wizball. Hewson didn't turn up but their Eagles were on sale elsewhere. Jeff Minter wasn't there, so we are still guessing about a release date for Revenge 2 and whether there are going to be any more C16 conversions.

The giant US Gold also refused to honour us with their

presence, so we did not have a chance to see Metrocross, Roadrunner, World Class Leaderboard (the fourth so far) or Killed Until Dead. Budget Wonders, Mastertronic were not there, neither were their newly acquired full price label, Melbourne House. Activision weren't there, so we couldn't see how their arcade conversions of Wonderboy and Quartet were coming along. This also meant that there was no news of their offshot, System 3's Last Ninja, which should have come out in January.

Also missing were Ariolasoft, Firebird and Codemasters but it was their loss, not ours. Their software was selling fast, and if they didn't want to be there to cash in on it, so be it. That was the attitude shared by most at the show, we got the software and those who did turn up made a fortune. The show was a great success without the Elites, Palaces and US Golds.

Bargains Galore

There were some real bargains, however, Thai Boxing, Alleykat, Lightforce, Terra Cresta, Bazooka Bill, Psycastria, Now Games, Impossible Mission, Ghosts and Goblins. Many, many more were £2 or less, so as you can imagine, to snap up these bargains, a bit of elbow was required! Gimmick of the show award went to Postronix, the mail order software and video suppliers who were selling the major new releases such as Barbarians and The Big Four at £8 each, £2 above most others, but they were throwing in a free camera with every purchase. Many people, including myself were taken in by this. How well it will work, I don't know, but Postronix are laughing all the way to the bank.

There were a few hardware bargains on offer, such as the Music Expansion System at £75, but it's been available by mail-order at this price for a good few months now. There was the odd tener off a disk-drive, printer or monitor here or there, but there was no kindness from Commodore (so what's new?). They might at least have given us £100 off the Amiga A500, or thrown in a free monitor, but no such luck. The hardware stands had many people gazing in awe, but not many buying. With the exception of the A500, we'd seen it all before. The hardware stands were offering nothing new, and any discounts were minimal. With games like Lightforce and Tenth Frame at £2 it was destined to be a software show with or without the support of the major software houses, and it was.

Gamers had the bargains of a lifetime, and there was a new feature this year, 16C64s (not the lager) in a segment all their own. All with games loaded up so players could try out some of the latest releases of the companies who didn't exhibit. This too was very popular, and almost as crowded as the software stands. Anyway, as I have said, it was a software show, and a very good one at that, and I would advise anyone who did not go, to go to the next one, and maybe next time there will be more hardware support, and, of course, bargains.

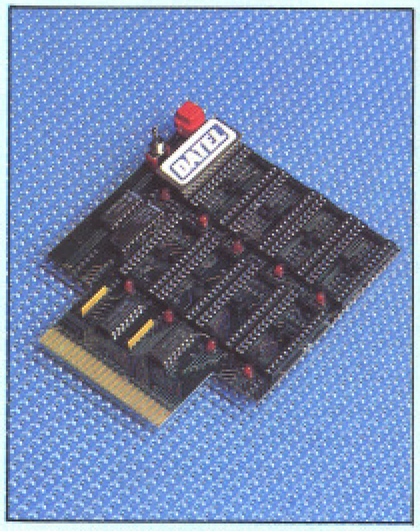
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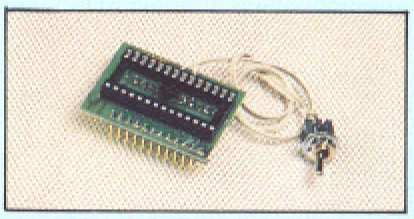
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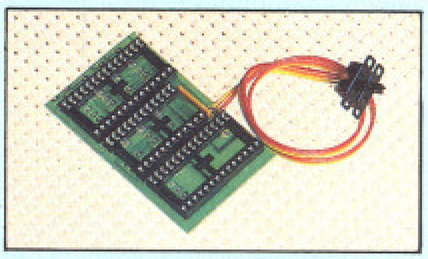




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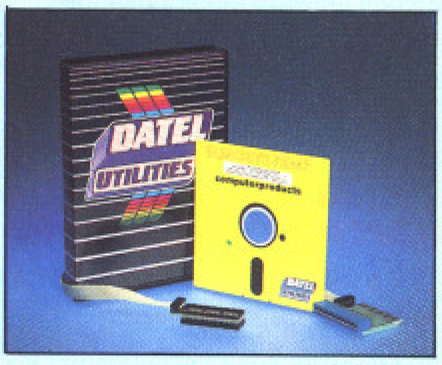


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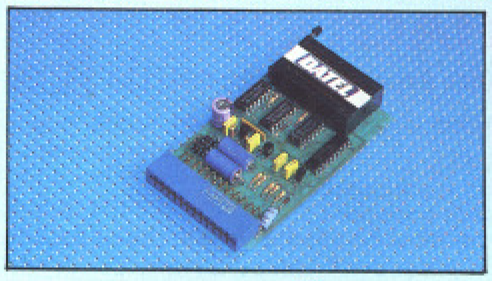
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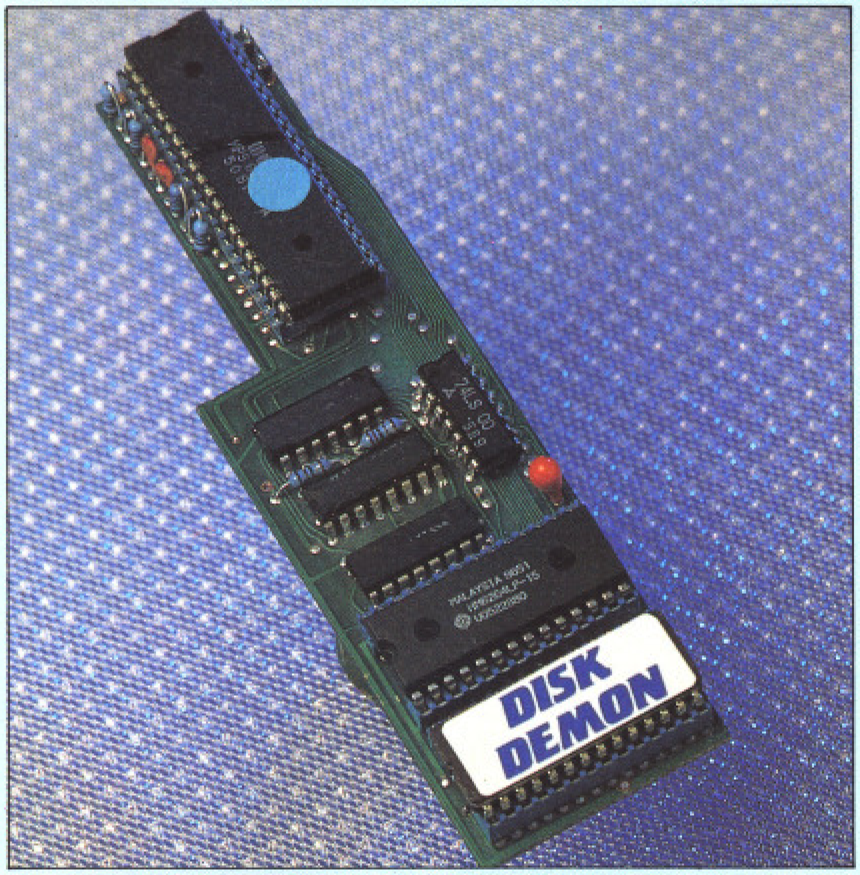


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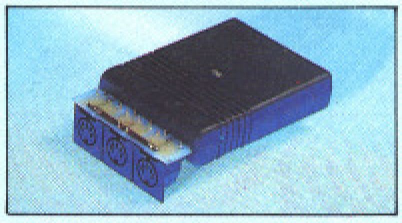
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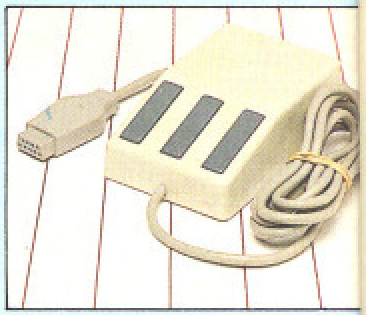


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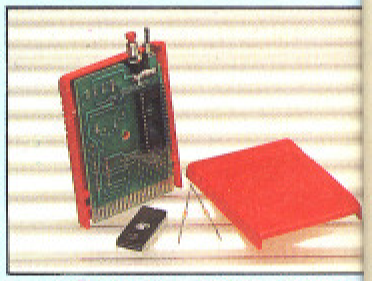
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Hook-Ups

Is your poor little 64 sitting in a corner with no-one to talk to? No more! Follow this series, and your computers could soon be communicating with Beebs. Species, and even other 64s!

By Mycroft Appleby

With the lack of a 'real' RS232 port and a decent operating system, the Commodore 64 tends to be a lonely computer, sitting on its own, talking to its own peripherals, but being ignored by all the posher computers as they talk to each other.

Why this is so is a bit of a mystery. Compared to the BBC Micro, which leads in the communications stakes, the C64 is more than well enough endowded. The BBC Micro has a printer and disk drive port; the C64 has its intelligent peripherals bus — a considerably more advanced piece of interfacing. The BBC has eight lines of user port with two handshake lines; so does the C64, but provided by a much more advanced chip and with extra handshake lines.

The BBC has a four line RS423 interface; the C64 has a full spec RS232C (almost!). The BBC has four A to D converters; so does the C64, and some joystick ports too. The BBC has the 1MHz bus and the tube; the hardware of the C64 cartridge port is more advanced than both these put together.

What it comes down to is software; the in-built software in the C64 stinks. You have to write all the assembler yourself and the operating system just doesn't want to know.

The user port can transmit data at very high rates, with no errors and with very little hassle. As a lot of other computers have similar capabilities for a parallel interface like this, usually called a printer interface, though on occasion it is hooked up to some joystick ports. With suitable software, you should be able to send huge amounts of data, at extremely high speed, between any popular computer and the Commodore 64.

Imagine using a BBC Micro to develop a program on, and then sending the code down the line to the C64, or sending graphics information from a C64 to an Amstrad for plotting on its hi-res screen!

The possibilities are endless. Communication between two or more computers is great once you start. The power of the modern microcomputer is astounding. But when you get two processors hooked up together sharing tasks it gets even better. A lot of 'serious' computer enthusiasts have more than one computer because some computers are better suited for some jobs than others. You wouldn't buy a C64 because of its fast disk drive, or masses of development software. But on the other hand you wouldn't get a BBC Micro just for games.

And then...

What this series is setting out to do is to provide hardware and software details of hooking up a Commodore 64 to any other popular home computer. I intend covering connecting to BBC, Amstrad CPC, Spectrum, Atari, and of course other Commodore 64s.

To do this a few concepts need explaining first. Next month will be the first practical example of the connection of a BBC Micro and a Commodore 64. This month we will look at the hardware involved.

Most computers have serial and parallel ports, both of which can be used for communication.

A serial port is designed to use as few wires as possible to connect two computers together — in a minimum-configuration one-way system, just two wires are needed. The eight bits in a byte of information are sent down the line one after another to be picked up at the other end. Complex error checking is needed, as it is easy to miss bits or count them twice, and this makes the software extremely complex. Also, the two computers have to be perfectly synchronised. In general, serial communication is a pain even at the best of times. We will not be using serial communication!

Parallel communication is another kettle of fish. It uses enough wires to send all eight bits in the byte at once. However, the disadvantage of this is that more wires are needed — a minimum of 11 for our purposes (eight for the data, one earth and two for control). Also, this type of communication is more susceptible to interference than serial with its error checking, so parallel links are usually limited to 10 feet in length of cable run.

Parallel communication goes at the speed of the slowest computer, but is typically at least ten times faster than serial communciation.

How do you do!

The extra lines in the connection are used by the communicating computers to tell each other that the data is being put on the line. They are called handshaking lines. The sending computer tells the receiving computer that there is data on the line, and once the receiving computer has received the data, it sends a signal to say that it has the data and is ready for the next lot. The process then repeats.

The hand-shaking lines can be interrupt operated or checked manually. They can be set manually, or automatically by the chip responsible to the interfacing to the rest of the computer.

A detailed example will make this a lot clearer, so let us consider two C64s talking to each other. The handshaking is in full interrupt receive ode and both computers have lvanced software that allows the mputer to get on with other tasks hile the data is being received. A typical interchange would go as follows:

The sending computer sets its user port to full output mode. This means that all the I/O lines in the user port will be used for sending data. The byte to be sent is put onto the output port. This makes the port take up the binary image of the byte being sent. Each one of the eight lines represents a binary 0 or a 1, with 0V for 0 and 5V for 1. The sending computer then flips its handshake line from 0V to 5V and back again. It then waits, looking at the other handshake line from the receiving computer.

At the other end of the cable, the receiving computer is expecting something to appear on the connection and so has set its I/0 user port to full input mode (if it hasn't, there will by now be two fried I/0 chips!) This means that 5V on any of the lines will be read as a binary 1 by this computer and 0V as a binary 0. It has also set up an interrupt program around the handshake line from the sending computer. But at the moment it is minding its own business and getting on with something else.

Suddenly the handshake line from the sending computer 'bounces' and this makes the interface chip interrupt the receiving computer from whatever it is doing and look at the input port. "Ah ha!, a byte," the receiving computer thinks and reads it. Having read the byte it 'bounces' the handshake line back to the sending computer and gets back to whatever it was doing.

The sending computer however, has noticed the change in the handshake line from the receiving computer and puts another byte onto the output port — and so the cycle continues.

These bytes could be anything: data transfer, memory dumps, screen messages, graphics information, or data to control the other computer.

The Hardware

The connection is to be made from one User Port to the other, all eight I/0 lines of one computer to the other; this is the main data highway. FLAG 2 is the NMI generating incoming handshake line on the C64 side and PA2 is the main outgoing one. FLAG2 gets connected to CB1 on the BBC side which is the outgoing handshake line from the BBC micro. PA2 is connected to CB2 which is the IRQ generating incoming handshake line of the BBC. Ground is common as usual.

The User Port of the C64 is the port on the far left of the machine as you look at it from the front. The User Port occupies all the connections on the bottom of this connector. The connections on the top are of some use, but not in this application, mainly being used to power external devices using this port.

The configuration (looking at the port from the rear) is as follows:

Gnd FLAG2 DO D1 D2 D3 D4 D5 D6 D7 PA2 Gnd

The plug that you need is a standard 0.156 inch pitch edge connector and needs to be soldered I'm afraid.

The BBC side is slightly easier being a 20 way IDC connector. You find the User Port on a BBC by lifting up the machine at the front and looking at the connector with USER PORT written on it — easy!

The configuration on the top is:

CB1 CB2 D0 D1 D2 D3 D4 D5 D6 D

and on the bottom:

5V 5V 0V 0V 0V 0V 0V 0V 0V 0V

Under no circumstances shou either of the 5V lines be connected u though as many of the 0V gnd lin should be carried across as possib look at the drawing to see how t wires should be crossed.

As an addition you can mount small button on top of t Commodore 64 connector connectin up the first and third connections the top of the port (looking from t rear). This will reset the machine an can be very useful.

Now the hardware is sorted o let's proceed to the difficult bit . . .

The Software

Taking the User Ports of bo machines, there would seem to be n trouble. Both have eight lines programmable I/0 with tw handshake lines. In theory, all yo have to do is connect up the eight I/ lines to provide your byte transfer, an cross the two handshake lines to so out the acknowledges and busys.

The trouble is that the I/0 chips i each of the machines are slightl different types. The BBC micro has th older 6522 VIA while the C64 has th newer 6526 CIA. The VIA (versati interface adaptor) is a chip that dat from the mid-seventies while the CI (compex interface adaptor) wa designed for the C64, and is muc more recent.

Most of the differences don bother us, but the handshaking i handled slightly differently. Bot handshake lines on the BBC side ar automatic, i.e. when you write a byt to the port a handshake i generated. (Although this can b turned off.) However on the C64 sid the 'in' side of the handshake line i connected to an NMI interrupt latch This is a bit in a register that is set whe a pulse is received on the incomin handshake line and can set off an NM interrupt if needed.

The out side of the handshake o the C64 side is completely manua though the input handshake on th

BC side either generates an IRQ terrupt or just sets a latch bit.

The important thing is that both ese chips need pulses within certain rations to work. Given that the BC's I/0 circuitry is clocked down om the usual 2MHz to around 1MHz d the C64 runs at 0.98MHz there ouldn't be any problem. However some C64s and BBCs the tolerances e not just right and during a fast ansfer of up to 1K they seem to get t of synch and you end up with the uation that both computers are aiting for the other to do something. This can be straightened out with lay loops, but this reduces the speed data transfer so much that I andoned this line of research.

st Popping Out for a Nybble

n the end I decided to use the low four its for a nybble transfer, the high two its for manual handshaking, and the ther bits for a purpose that I shall eveal later.

Nybble transfer isn't as slow as you ay at first think. In fact you need a topwatch and a large amount of data o transfer just to spot the difference.

Handshaking will still operate in he same manner, but this time only our bits are transmitted at a time ather than eight. The sending nachine has to split the byte to be sent nto two, while the receiving machine as to assemble them. With the nanual handshaking, this will now ink up any BBC Micro and C64.

The reason that nybbles had to be used was the lack of suitable manual I/0 lines on either side of the fence, so two data lines had to be used.

However you are not left with the two old handshake lines, these can be used for attracting the attention of the the other machine — to indicate when transfer is to start. It is only used once so all is safe. As both lines are interrupt driven, it is possible to then have a send only system. This overcomes the main problem that most communications widgets like this have. Running to one keyboard to put it in receive mode then running to the other machine to put it into send mode.

With this system all you have to do is tell one computer to send. It then tells the other computer to stop whatever it is doing, accept a long string of data, and then both computers return to their original tasks; all quite neat really.

The software listed here is in BBC format. This is because to use the hook-up you need to have a BBC present and as the BBC has a much better assembler and is much faster at loading, it is easier to load a small boot program into the C64, then load the C64 transfer program into the BBC and squirt it down the line.

So to load the system in you should first load the C64 boot program into the C64, load the C64 transfer program into the BBC and run it, run the C64 boot program, type 'CALL TRANSFER' into the BBC and wait a few seconds then type in 'SYS 49152. Then load and run the BBC operating program. You are then ready to start.

the data (this is unused at present, but I thought that it might come in useful!).

CALL SEND on the BBC, and SYS 49334 on the C64 starts the transfer. As I said, reception of the data is completely automatic. On the BBC side as most of the memory location pointers are not fixed and have variable locations. this is to make the code relocatable, change the appropriate lines at the beginning of the program to something more sensible if you need to. Also remember that variables disappear if you load another program, so make a note of their values. all pointers to memory chunks are in standard lo-hi order.

Initialisation should also be performed after a Restore or Reset.

C64	Function	BBC
&F7,&F8	Destination memory address	&72,&73
&FB,&FC	Origin memory address	&70,&71
&F9,&FA	Length	len
&033A	Cmd byte	cmd
44334	Send Data	SEND
49152	Initialise	SETUP

How to operate it

The software works by transfering chunks of memory around. You specify (in the sending machine) start location, length, and destination location, as well as a command byte to tell the other machine what to do with

The applications of this are enormous, I'm already using my BBC Micro as a data store for my C64 — it's so fast, forget about disk drives.

Next I'll be tackling the Amstrad CPC series, so get those soldering irons hot! YC

PROGRAM: HOOK-UP BOOT

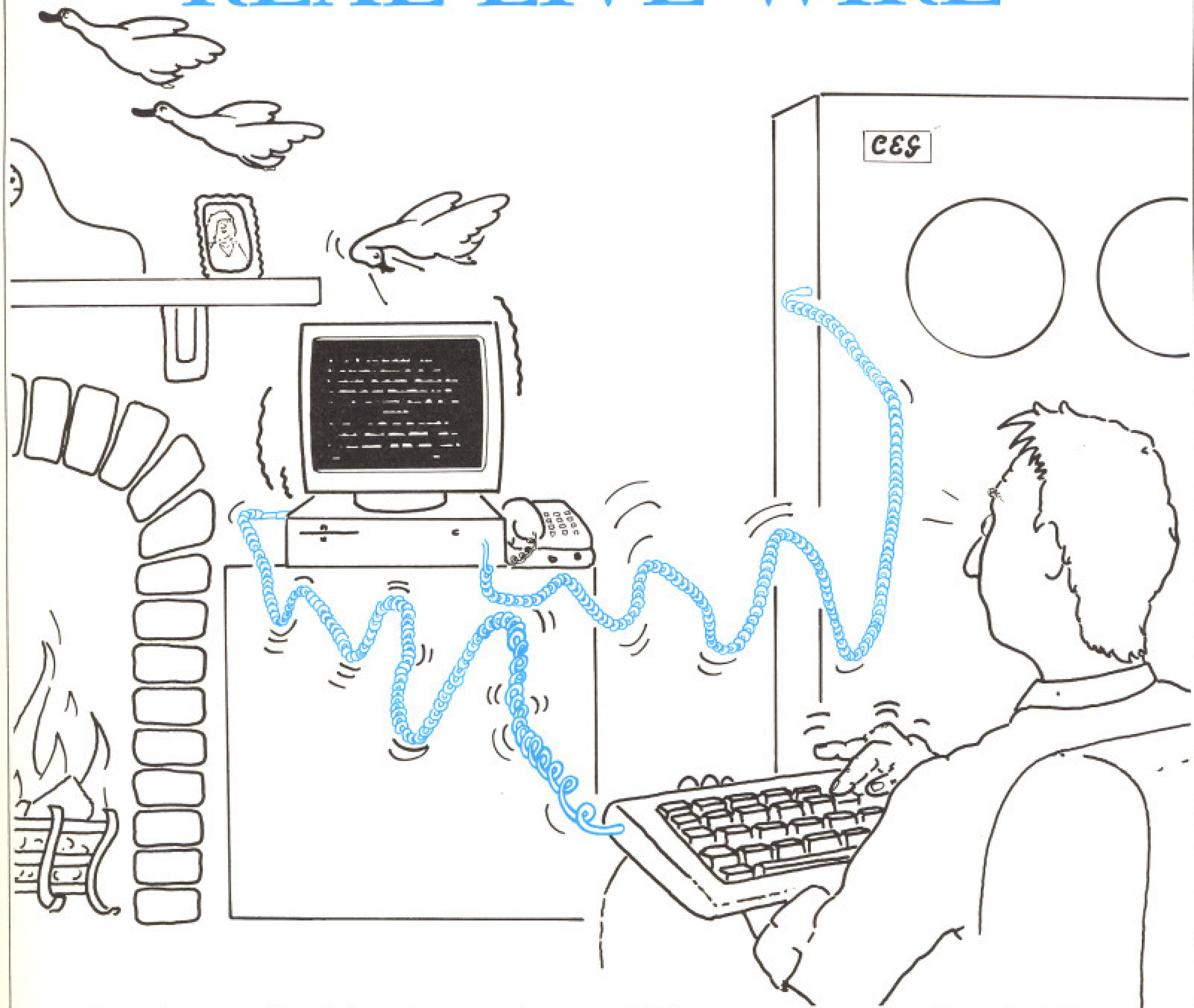
```
16  5 REM C64 BOOT PROGRAM FOR B
    BC CONNECTIONS
95  10 POKE56579,0:A=49152:L=PEE
    K(56589)
9E  20 FORL=0TO511
A6  30 IF(PEEK(56589)AND16)=0THE
    N30
23  40 B=PEEK(56577):POKEA+L,B
37  50 POKE56576,147:POKE56576,1
    51
BE  60 NEXT
C6  70 END
```

PROGRAM: C64 CODE

```
   10DIM CODE &0800,C64code &080
0
   20irq2v=&206:oldv=&F8:flag=&7
0:port=&FE60
   30ddr=port+2:pcr=port+12:ifr=
port+13:ier=port+14
   40FOR PASS=0 TO 2 STEP 2
   50PRINT"PASS "PASS
   60P%=CODE
   70[OPT PASS
   80.setup sei : lda irq2v
   90sta oldv
  100lda irq2v+1
  110sta oldv+1
  120lda #newv MOD 256
  130sta irq2v
  140lda #newv DIV 256
  150sta irq2v+1
```

```
160lda #128+16
170sta ier
180cli
190rts
200\
210.RESET sei
220lda oldv
230sta irq2v
240lda oldv+1
250sta irq2v+1
260cli
270rts
280\
290.newv lda ifr
300and #128+16
310cmp #&00
320beq finirq
330sta ifr
340lda #&01
350sta flag
360.finirq jmp (oldv)
370\
380.get lda #00
390sta flag
400.loop1 lda flag
410beq loop1
420lda #&00
430sta flag
440rts
450\
460.TRANSFER jsr setup
470lda #255
480sta ddr
490lda #128+64+32
500sta pcr
510ldx #&00
520.loop2 lda C64code,X
530jsr wbyte
540jsr get
550inx
560bne loop2
570.loop3 lda C64code+256,X
580jsr wbyte
590jsr get
600inx
610bne loop3
620rts
630\
640.wbyte sta port
650lda #128+64
660sta pcr
670lda #128+64+32
680sta pcr
690rts
700]
710NEXT PASS
720:
730REM Start of C64 code to be ported
740:
750port=&DD01:ddr=&DD03:pa2=&DD00:flag1=&DD0D
760data=&F7:len=&F9:from=&FB:image=&0338:half=&0339:cmd=&033A
770irqv=&0314:oldirqv=&0334
780FOR PASS=4 TO 6 STEP 2
790PRINT"C64 PASS "PASS
800P%=&C000:O%=C64code
810[OPT PASS
820.SETUP sei
830ldx irqv
840stx oldirqv
850ldx irqv+1
860stx oldirqv+1
870ldx #(NEWIRQ MOD 256)
880stx irqv
890ldx #(NEWIRQ DIV 256)
900stx irqv+1
910cli
920ldx #&00
930stx flag
940jsr SET_RECEIVE_MODE
950rts
960\
970.NEWIRQ pha
980lda flag1
990and #&10
1000cmp #&00
1010beq noirq
1020txa : pha : tya : pha
1030lda #&00
1040sta half
1050lda port
1060and #&80
1070sta image
1080jsr SHAKE
1090jsr GTDATA
1100pla : tay : pla : tax
1110.noirq pla
1120jmp (oldirqv)
1130\
1140.WAIT lda port
1150and #&80
1160cmp image
1170beq WAIT
1180sta image
1190rts
1200\
1210.SET_SEND_MODE lda #&4F
1220sta ddr
1230rts
1240\
1250.SET_RECEIVE_MODE lda #&40
1260sta ddr
1270rts
1280\
1290.WBYTE tax
1300jsr WLNYB
1310jsr SHAKE
1320jsr WAIT
1330jsr WHNYB
1340jsr SHAKE
1350rts
1360\
1370.WLNYB lda port
1380and #&F0
1390sta half
1400txa
1410and #&0F
1420ora half
1430sta port
1440rts
1450\
1460.WHNYB lda port
1470and #&F0
1480sta half
1490txa
1500lsr A : lsr A : lsr A : lsr A
1510and #&0F
1520ora half
1530sta port
1540rts
1550\
1560.SHAKE lda port
1570eor #&40
1580sta port
1590rts
1600\
1610.TRANSMIT jsr SET_SEND_MODE
1620lda port
1630and #&80
1640sta image
1650lda #&00
1660sta half
1670rts
1680\
1690.SEND jsr TRANSMIT
1700jsr GENBBCIRQ
1710jsr WAIT
1720nop : nop : nop : nop : nop : nop : nop : nop : nop : nop
1730jsr OUTPACKET
1740jsr OUTDATA
1750jsr SET_RECEIVE_MODE
1760rts
1770\
1780.GENBBCIRQ lda pa2
1790ora #&04
1800sta pa2
1810nop : nop : nop : nop : nop
1820lda pa2
1830and #&FB
1840sta pa2
1850rts
1860\
1870.LDBYTE jsr LDNYB
1880sta half
1890jsr SHAKE
1900jsr WAIT
1910jsr LDNYB
1920asl A
1930asl A
1940asl A
1950asl A
1960ora half
1970pha
1980jsr SHAKE
1990pla
2000rts
2010\
2020.LDNYB lda port
2030and #&0F
2040rts
2050\
2060.RECEIVE lda #&00
2070sta half
2080lda port
2090and #&80
2100sta image
2110jsr SHAKE
2120jsr GTDATA
2130rts
2140\
2150.OUTPACKET
2160lda data
2170jsr WBYTE
2180jsr WAIT
2190lda data+1
2200jsr WBYTE
2210jsr WAIT
2220lda len
2230jsr WBYTE
2240jsr WAIT
2250lda len+1
2260jsr WBYTE
2270jsr WAIT
2280lda cmd
2290jsr WBYTE
2300jsr WAIT
2310rts
2320\
2330.OUTDATA ldy #&00
2340lda len+1
2350beq lastwpage
2360.wloop lda (from),Y
2370jsr WBYTE
2380JSR WAIT
2390iny
2400bne wloop
2410dec len+1
2420inc from+1
2430jmp OUTDATA
2440.lastwpage lda len
2450beq endwpage
2460ldy #&00
2470.loop1 lda (from),Y
2480jsr WBYTE
2490JSR WAIT
2500iny
2510cpy len
2520bne loop1
2530.endwpage rts
2540rts
2550\
2560.GTDATA
```

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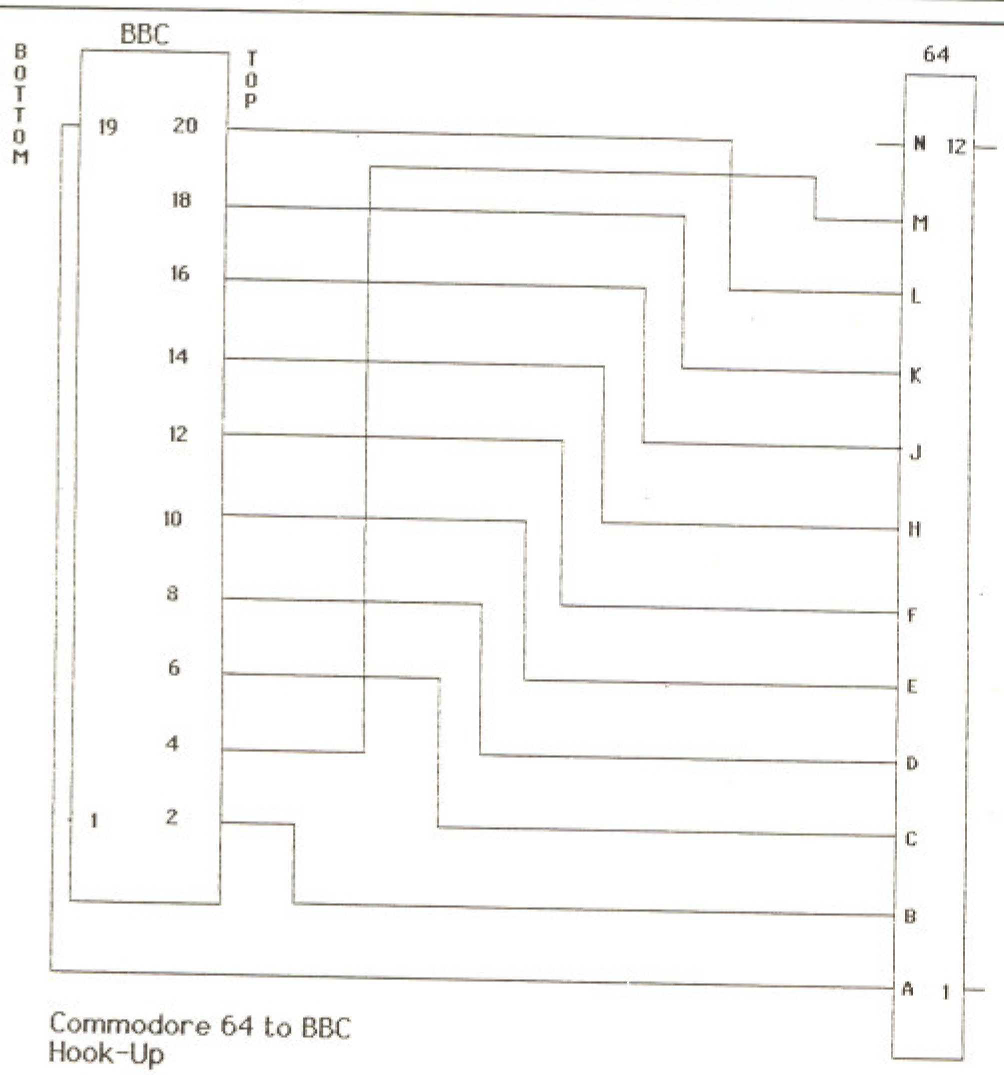
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____

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Micro ____________________ YCOMM/9/87

```
2570jsr WAIT
2580jsr LDBYTE
2590sta data
2600jsr WAIT
2610jsr LDBYTE
2620sta data+1
2630jsr WAIT
2640jsr LDBYTE
2650sta len
2660jsr WAIT
2670jsr LDBYTE
2680sta len+1
2690jsr WAIT
2700jsr LDBYTE
2710sta cmd
2720\
2730.dataloop ldy #&00
2740lda len+1
2750beq lastrpage
2760.rloop jsr WAIT
2770jsr LDBYTE
2780sta (data),Y
2790iny
2800bne rloop
2810dec len+1
2820inc data+1
2830jmp dataloop
2840.lastrpage lda len
2850beq endrpage
2860ldy #&00
2870.loop2 jsr WAIT
2880jsr LDBYTE
2890sta (data),Y
2900iny
2910cpy len
2920bne loop2
2930.endrpage rts
2940\
2950]
2960NEXT PASS
```



Commodore 64 to BBC Hook-Up

PROGRAM:BBC CODE

```
10DIM CODE &0800
20irq2v=&206:oldv=&F8:from=&70:data=&72:port=&FE60
30ddr=port+2:pcr=port+12:ifr=port+13:ier=port+14
40DIM cmd 1,len 2,flag 1,half 1,image 1
50FOR PASS=0 TO 2 STEP 2
60PRINT"PASS "PASS
70P%=CODE
80[OPT PASS
90.SETUP sei
100lda irq2v
110sta oldv
120lda irq2v+1
130sta oldv+1
140lda #(newv MOD 256)
150sta irq2v
160lda #(newv DIV 256)
170sta irq2v+1
180lda #128+16
190sta ier
200cli
210jsr SET_RECEIVE_MODE
220rts
230\
240.newv lda ifr
250and #128+16
260cmp #&00
270beq finirq
280sta ifr
290jsr RECEIVE
300.finirq jmp (oldv)
310\
320.WAIT lda port
330and #&40
340cmp image
350beq WAIT
360sta image
370rts
380\
390.SET_SEND_MODE lda #&8F
400sta ddr
410rts
420\
430.SET_RECEIVE_MODE lda #&80
440sta ddr
450rts
460\
470.WBYTE tax
480jsr WLNYB
490jsr SHAKE
500jsr WAIT
510jsr WHNYB
520jsr SHAKE
530rts
540\
550.WLNYB lda port
560and #&F0
570sta half
580txa
590and #&0F
600ora half
610sta port
620rts
630\
640.WHNYB lda port
650and #&F0
660sta half
670txa
680lsr A : lsr A : lsr A : lsr A
690and #&0F
700ora half
710sta port
720rts
730\
740.SHAKE lda port
750eor #&80
760sta port
770rts
780\
790.OUTPACKET
800lda data
810jsr WBYTE
820jsr WAIT
830lda data+1
840jsr WBYTE
850jsr WAIT
860lda len
870jsr WBYTE
880jsr WAIT
890lda len+1
900jsr WBYTE
910jsr WAIT
920lda cmd
930jsr WBYTE
940jsr WAIT
950rts
960\
970.OUTDATA ldy #&00
980lda len+1
990beq lastwpage
1000.wloop lda (from),Y
1010jsr WBYTE
1020JSR WAIT
1030iny
```


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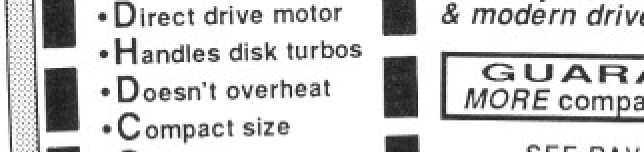
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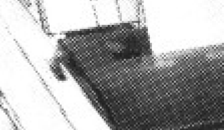
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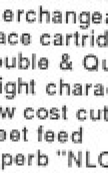
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The speed and efficiency is **incredible**, who would believe that the humble old 1541 could load 202 **blocks in less than 5 secs.** It is compatible with the majority of commercial software and can be switched out when necessary. One of the real pleasures of using this system is to use it with the likes of Easyscript & Superbase to speed up both the **normal loading and the sequential files**. It is important to point out that this is achieved using **standard** CBM disk format and not a special system, therefore you can still use your existing disks.

SOME OF THE FEATURES

- LOAD speed 25x normal (PRG)
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- Compatible with standard DOS
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INSTALLATION

Fitting involves fitting two sub assembly boards, one in the 64/128 and one in the 1541. Normally these just plug in but some '64s need a small amount of soldering.

EXTRAS AVAILABLE

User port expansion card...£14.95
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```
1040bne wloop
1050dec len+1
1060inc from+1
1070jmp OUTDATA
1080.lastwpage lda len
1090beq endwpage
1100ldy #&00
1110.loop1 lda (from),Y
1120jsr WBYTE
1130JSR WAIT
1140iny
1150cpy len
1160bne loop1
1170.endwpage rts
1180rts
1190\
1200.TRANSMIT jsr SET_SEND_MODE
1210lda port
1220and #&40
1230sta image
1240lda #&00
1250sta half
1260rts
1270\
1280.SEND jsr TRANSMIT
1290jsr GEN64IRQ
1300jsr WAIT
1310nop : nop : nop : nop : nop
: nop : nop : nop : nop : nop
1320jsr OUTPACKET
1330jsr OUTDATA
1340jsr SET_RECEIVE_MODE
1350rts
1360\
1370.GEN64IRQ lda #128+64
1380sta pcr
1390nop : nop : nop : nop : nop
1400lda #128+64+32
1410sta pcr
1420rts
1430\
1440.LDBYTE jsr LDNYB
1450sta half
1460jsr SHAKE
1470jsr WAIT
1480jsr LDNYB
1490asl A
1500asl A
1510asl A
1520asl A
1530ora half
1540pha
1550jsr SHAKE
1560pla
1570rts
1580\
1590.LDNYB lda port
1600and #&0F
1610rts
1620\
1630.GTDATA
1640jsr WAIT
1650jsr LDBYTE
1660sta data
1670jsr WAIT
1680jsr LDBYTE
1690sta data+1
1700jsr WAIT
1710jsr LDBYTE
1720sta len
1730jsr WAIT
1740jsr LDBYTE
1750sta len+1
1760jsr WAIT
1770jsr LDBYTE
1780sta cmd
1790\
1800.dataloop ldy #&00
1810lda len+1
1820beq lastrpage
1830.rloop jsr WAIT
1840jsr LDBYTE
1850sta (data),Y
1860iny
1870bne rloop
1880dec len+1
1890inc data+1
1900jmp dataloop
1910.lastrpage lda len
1920beq endrpage
1930ldy #&00
1940.loop2 jsr WAIT
1950jsr LDBYTE
1960sta (data),Y
1970iny
1980cpy len
1990bne loop2
2000.endrpage rts
2010\
2020.RECEIVE lda #&00
2030sta half
2040lda port
2050and #&40
2060sta image
2070jsr SHAKE
2080jsr GTDATA
2090rts
2100\
2110]
2120NEXT PASS
2130CALL SETUP
```

LIFESAVERS 5	C64	FLASH ROUTINE	1/1

If you like the flashing border on the fast tape loaders then this routine is for you.

The first thing the routine does is POKE the machine code that is the workhorse of the routine into memory. One or two demonstrations follow.

To use the program you should:

1) Make sure that the machine code presented here is in memory.
2) POKE830,INT(NC/256)
3) POKE829,NC-PEEK(830)*256
4) POKE831,DE
5) POKE832,FL
6) SYS 51200 to start the routine.

Where:
DE is a delay between 1 and 255;
FL is the flag for what to flash (1=border, 2=screen,3=both);
NC is the number of loops.

```
10 REM *** FLASH ROUTINE ***
20 DATA 169,0,141,60,3,174,60,3,
189,63,200,172,64,3,192,2,240,3,
141,32,208
30 DATA 192,1,240,3,141,33,208,3
2,56,200,232,224,16,208,228,206,
61,3,173,61
40 DATA 3,208,212,173,62,3,240,6
,206,62,3,76,0,200,96,172,63,3,1
36,208,253
50 DATA 96,2,3,4,5,6,7,8,9,0,13,
14,10,6,7,8,9,13
60 FOR I=51200TO51279:READX:POKE
 I,X:NEXT
70 REM *** DEMO ***
80 PRINT CHR$(147),CHR$(5)
90 NC=1000:DE=36:FL=3:GOSUB 150
100 NC=10000:DE=1:GOSUB150
110 NC=1000:DE=221:GOSUB 150
120 NC=300:FL=1:FORDE=1TO80STEP5
:GOSUB150:NEXT
130 NC=300:FL=2:FORDE=1TO80STEP5
:GOSUB150:NEXT
140 END
150 POKE830,INT(NC/256):POKE829,
NC-PEEK(830)*256:POKE832,FL
160 POKE831,DE:SYS51200
170 RETURN
```

Diskit 7

Transfer your disk programmes to turbo tape with this handy utility.

By Les Allan

Disk-Turbotape enables a program that consists of just one part to be transferred from disk to cassette tape. The version on the tape will be saved at a turbo speed that is approximately 10 times that of the normal Commodore cassette.

A few restrictions do exist regarding the program that is to be transferred to tape.

1) The program MUST reside at $0801 i.e. Basic

2) The program MUST be less than 198 blocks long.

When used with the compactor that was printed earlier in this series (*Your Commodore March 1987*) you should find that you can transfer most of your programs to tape with ease.

In Use

Simply LOAD and RUN the utility and insert the disk which holds the program to be transferred into the disk drive. Enter the name of the program to be transferred and press 'Y' when prompted for 'Tape Header'. The turbo loader will now be SAVEd to your cassette. Once this is done the program will be LOADed from disk and SAVEd to tape at turbo speed.

Should you want to give the program on tape a different name to the one on this disk then follow the above procedure but when asked for the name of the file to transferred enter the new name. The turbo loader will then be SAVEd out to tape with the new name. When the program searches for the program it will stop with an error since the program that it is looking for isn't on the disk. Now simply re-RUN the program and enter the correct name for the program as stored on disk, but this time enter 'N' when prompted for 'Tape Header'. The program will now be SAVEd after the loader on your tape.

Getting It All In

The program is presented as a Basic program. Use the SYNTAX CHECKER from the LISTINGS page to make sure that you are entering each line correctly. Error trap routines are included within the program as a further check of your typing.

When the Basic program presented here is RUN it will SAVE the Disk-Turbotape program onto the disk in the drive. It is this program that you should use when you need the program. NOT the Basic loader presented here. YC

```
PROGRAM: DISK-TURBO BOOT

3A  10 M1=32768:M2=34832:CH=0
97  11 PRINTCHR$(144)CHR$(147)
C8  12 POKE52,120:POKE56,120:POKE
    53280,15:POKE53281,12
94  13 PRINT
8F  14 PRINTSPC(8)CHR$(18)"[SU,S*
    22,SI]
26  15 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
B4  16 PRINTSPC(8)CHR$(18)"[S-,SP
    C4]DATA  STATEMENT[SPC3,S-]
3C  17 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
E5  18 PRINTSPC(8)CHR$(18)"[S-]
    TO MEMORY  ROUTINE  [S-]
4A  19 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
22  20 PRINTSPC(8)CHR$(18)"[S-,SP
    C5]BY LES ALLAN[SPC5,S-]
50  21 PRINTSPC(8)CHR$(18)"[S-,SP
    C22,S-]
6C  22 PRINTSPC(8)CHR$(18)"[SJ,S*
    22,SK]
A0  23 PRINT:PRINTCHR$(155)
42  24 PRINT" THIS ROUTINE READS
    THE DATA STATEMENT,"
80  25 PRINT
17  26 PRINT" CONVERTS FROM  HEX
    TO BINARY AND POKES"
82  27 PRINT
C4  28 PRINT" CODE BACK  TO THE
    AREA OF MEMORY FROM"
84  29 PRINT
19  30 PRINT" WHICH  IT  WAS  PRE
    VIOUSLY  GENERATED."
59  31 PRINT:PRINT
D0  32 READCODE$
BB  33 LB=ASC(RIGHT$(CODE$,1))-48
    :IFLB>9THENLB=LB-7
CF  34 HB=ASC(LEFT$(CODE$,1))-48:
    IFHB>9THENHB=HB-7
32  35 PRINTSPC(5)CHR$(5)"READING
     MEMORY BLOCK ...";M1:PRINTCH
    R$(145);
28  36 POKEM1,HB*16+LB:M1=M1+1:CH
    =CH+HB+LB:IFM1<M2THEN32
F0  37 IFCH=24844THEN39
13  38 PRINT"CHECK SUM ERROR - CH
    ECK DATA STATEMENTS!":PRINTCH
    R$(19):END
EC  39 PRINT"  HIT RETURN TO SAVE
     COMPLETED PROGRAM"
D1  40 GETKEY$:IFKEY$<>CHR$(13)TH
    EN40
5C  41 SYS34736
10  42 :
CE  43 ::::::::::::::::::::: DATUM S
    TATEMENTS :::::::::::::::::::
16  44 :
AD  45 DATA 00,0B,08,00,00,9E,32,
    30,36,31,00,00,00,20,44,E5
71  46 DATA A9,0C,8D,20,D0,8D,21,
    D0,EA,A9,36,85,01,4C,CF,0E
44  47 DATA 31,34,37,29,3A,99,00,
    4F,08,0C,00,99,A6,36,29,22
D7  48 DATA 12,90,D5,C3,1A,F4,C9,
    00,77,08,0D,00,99,A6,36,29
3E  49 DATA 22,12,90,DD,20,1A,F4,
    DD,00,9F,08,0E,00,99,A6,36
67  50 DATA 29,22,12,90,DD,20,1A,
    F4,DD,00,C7,08,0F,00,99,A6
AA  51 DATA 36,29,22,12,90,DD,20,
    04,F4,44,49,53,4B,20,54,4F
59  52 DATA 20,54,55,52,42,4F,2D,
    54,41,50,45,20,04,F4,DD,00
B5  53 DATA EF,08,10,00,99,A6,36,
    29,22,12,90,DD,20,1A,F4,DD
E3  54 DATA 00,17,09,11,00,99,A6,
    36,29,22,12,90,DD,20,1A,F4
AA  55 DATA DD,00,3F,09,12,00,99,
    A6,36,29,22,12,90,DD,20,06
71  56 DATA F4,42,59,20,03,F4,4C,
    45,53,20,41,4C,4C,41,4E,20
```

```
75  57 DATA 06,F4,DD,00,67,09,13,
    00,99,A6,36,29,22,12,90,DD
92  58 DATA 20,1A,F4,DD,00,8F,09,
    14,00,99,A6,36,29,22,12,90
FE  59 DATA DD,20,1A,F4,DD,00,B7,
    09,15,00,99,A6,36,29,22,12
BD  60 DATA 90,CA,C3,1A,F4,CB,00,
    BF,09,16,00,99,3A,99,00,EE
81  61 DATA 09,17,00,99,22,9B,20,
    20,54,48,49,53,20,52,4F,55
EF  62 DATA 54,49,4E,45,20,53,41,
    56,45,53,20,46,52,4F,4D,20
F5  63 DATA 44,49,53,4B,20,54,4F,
    20,54,41,50,45,22,00,1C,0A
18  64 DATA 18,00,99,22,20,20,41,
    20,53,49,4E,47,4C,45,20,20
96  65 DATA 50,41,52,54,20,50,52,
    4F,47,52,41,4D,20,20,54,48
85  66 DATA 41,54,20,52,45,53,49,
    44,45,53,22,00,4A,0A,19,00
14  67 DATA 99,22,20,20,49,4E,20,
    4D,45,4D,4F,52,59,20,40,20
98  68 DATA 24,30,38,30,31,20,5B,
    31,39,38,20,42,4C,4B,53,5D
C2  69 DATA 2E,20,53,49,4D,50,4C,
    59,22,00,78,0A,1A,00,99,22
27  70 DATA 20,20,49,4E,53,45,52,
    54,20,54,41,50,45,20,20,49
1D  71 DATA 4E,54,4F,20,20,54,48,
    45,20,43,41,53,53,45,54,54
C5  72 DATA 45,20,44,45,43,4B,22,
    00,A6,0A,1B,00,99,22,20,20
6A  73 DATA 44,49,53,4B,45,54,54,
    45,20,20,49,4E,54,4F,20,44
08  74 DATA 52,49,56,45,20,26,20,
    45,4E,54,45,52,20,50,52,4F
90  75 DATA 47,52,41,4D,22,00,D4,
    0A,1C,00,99,22,20,20,4E,41
B6  76 DATA 4D,45,2E,20,54,48,45,
    20,48,45,41,44,45,52,20,49
3A  77 DATA 53,20,54,48,45,4E,20,
    53,41,56,45,44,2C,20,46,49
94  78 DATA 4C,45,22,00,02,0B,1D,
    00,99,22,20,20,4C,4F,41,44
5D  79 DATA 45,44,20,26,20,53,41,
    56,45,44,20,41,20,54,55,52
EF  80 DATA 42,4F,20,52,41,54,45,
    20,54,4F,20,54,41,50,45,21
F7  81 DATA 22,00,34,0B,1E,00,99,
    3A,99,3A,99,22,05,20,03,F4
4A  82 DATA 50,52,45,53,53,20,52,
    45,54,55,52,4E,20,54,4F,20
3D  83 DATA 49,4E,49,54,49,41,4C,
    49,53,45,20,50,52,4F,43,45
88  84 DATA 53,53,22,00,4A,0B,1F,
    00,A1,4B,24,3A,8B,4B,24,B3
99  85 DATA B1,C7,28,31,33,29,A7,
    33,31,00,56,0B,20,00,9E,31
79  86 DATA 33,AC,32,35,36,00,03,
    F4,4B,80,00,00,A0,00,00,EE
55  87 DATA FF,F4,EE,A2,F4,A9,00,
    A8,85,FB,85,FD,A9,0E,85,FC
92  88 DATA A9,08,85,FE,B1,FB,91,
    FD,C8,D0,F9,E6,FC,E6,FE,A5
07  89 DATA FE,C9,0D,D0,EF,4C,10,
    0C,EE,DD,F4,00,0B,08,00,00
FD  90 DATA 9E,33,30,38,38,00,06,
    F4,A2,00,BD,38,08,9D,41,03
26  91 DATA E8,E0,C0,D0,F5,D0,F5,
    A9,03,8D,31,03,A9,B2,8D,30
DA  92 DATA 03,A9,02,85,C6,A9,93,
    A2,83,8D,77,02,8E,78,02,60
53  93 DATA A0,08,20,51,03,26,BD,
    EE,20,D0,88,D0,F5,A5,BD,60
2D  94 DATA A9,10,2C,0D,DC,F0,FB,
    AD,0D,DD,8E,04,DD,4A,08,A9
27  95 DATA 99,8D,0E,DD,28,60,78,
    A9,7F,8D,0D,DD,AD,11,D0,29
6F  96 DATA EF,8D,11,D0,A2,84,A9,
    01,8D,05,DD,8E,04,DD,A5,01
40  97 DATA 29,DF,85,01,A9,00,85,
    BD,A0,01,20,43,03,C9,55,D0
88  98 DATA F7,20,41,03,D0,EE,20,
    41,03,A0,00,91,C3,E6,C3,D0
03  99 DATA 02,E6,C4,A5,C3,C5,AE,
    A5,C4,E5,AF,90,E9,58,4C,93
C7  100 DATA FC,86,21,84,22,A9,03
    ,85,C4,85,AF,A9,3C,85,C3,A9
5F  101 DATA 40,85,AE,20,17,F8,A9
    ,07,85,C0,20,67,03,A6,21,A4
45  102 DATA 22,86,C3,84,C4,A5,B9
    ,F0,0A,AD,3C,03,85,C3,AD,3D
DB  103 DATA 03,85,C4,18,A5,C3,6D
    ,3E,03,85,AE,A5,C4,6D,3F,03
04  104 DATA 85,AF,20,67,03,18,A9
    ,00,85,90,85,0A,4C,AA,F5,00
D2  105 DATA 03,F4,AD,11,D0,09,10
    ,8D,11,D0,A5,01,09,31,85,01
D2  106 DATA A9,07,85,C0,4C,93,FC
    ,A9,0D,20,D2,FF,4C,38,F8,00
77  107 DATA 05,F4,4D,54,4C,32,2C
    ,50,2C,52,20,0C,F4,93,9B,45
0C  108 DATA 4E,54,45,52,20,50,52
    ,4F,47,52,41,4D,20,4E,41,4D
A6  109 DATA 45,20,3A,00,5C,09,45
    ,53,53,20,50,4C,41,59,20,26
B8  110 DATA 20,52,45,43,4F,52,44
    ,2E,00,0B,08,00,00,9E,32,30
A9  111 DATA 36,34,3A,A2,00,05,F4
    ,0D,4C,4F,41,44,45,52,20,3F
46  112 DATA 00,0D,52,45,41,44,49
    ,4E,47,20,46,49,4C,45,0D,00
2D  113 DATA 86,F8,84,F9,A0,00,B1
    ,F8,20,D2,FF,F0,03,C8,D0,F6
D1  114 DATA 60,A9,08,20,B4,FF,A9
    ,6F,20,96,FF,A0,00,20,A5,FF
15  115 DATA 99,00,02,C8,C9,0D,D0
    ,F5,20,AB,FF,AD,00,02,C9,30
16  116 DATA D0,01,60,A0,00,20,D2
    ,FF,C8,B9,00,02,C9,0D,D0,F5
98  117 DATA EA,4C,78,0A,20,E7,FF
    ,A9,08,20,B1,FF,A9,6F,20,93
24  118 DATA FF,A9,49,20,A8,FF,A9
    ,0D,20,A8,FF,20,AE,FF,4C,96
32  119 DATA 09,85,BD,A2,08,EE,20
    ,D0,A5,BD,30,0B,20,0A,0A,20
A7  120 DATA 0A,0A,D0,08,20,07,0A
    ,20,07,0A,D0,00,26,BD,CA,D0
58  121 DATA E4,60,A0,C0,2C,A0,60
    ,8C,04,DD,A5,01,49,08,85,01
B6  122 DATA A9,99,8D,0E,DD,A9,01
    ,2C,0D,DD,F0,FB,60,78,A9,7F
C6  123 DATA 8D,0D,DD,AD,11,D0,29
    ,EF,8D,11,D0,A2,00,8E,05,DD
86  124 DATA A5,01,29,D6,85,01,A9
    ,00,85,A6,A9,FF,20,E6,09,E6
D6  125 DATA A6,D0,F7,A9,55,20,E6
    ,09,A9,00,20,E6,09,A0,00,B1
11  126 DATA C3,20,E6,09,E6,C3,D0
    ,02,E6,C4,A5,C3,C5,AE,A5,C4
B1  127 DATA E5,AF,90,E9,20,E6,09
    ,58,4C,FA,08,00,A2,E9,A0,0B
65  128 DATA 20,85,09,A2,0E,BD,86
    ,0A,9D,01,08,CA,10,F7,6C,02
B5  129 DATA A0,0D,08,00,00,9E,32
    ,39,33,33,3A,A2,00,03,F4,A2
C0  130 DATA 08,20,C6,FF,20,CF,FF
    ,85,21,20,CF,FF,85,22,20,CF
4D  131 DATA FF,A0,00,91,02,E6,02
    ,D0,02,E6,03,A5,03,C9,D0,D0
01  132 DATA 06,20,CC,FF,4C,71,0A
    ,A5,90,F0,E3,20,CC,FF,A5,03
1E  133 DATA 38,E9,0C,85,03,60,A0
    ,09,A2,76,20,85,09,A0,00,B9
3D  134 DATA 1C,09,20,D2,FF,C8,C4
    ,23,D0,F5,98,18,69,1C,8D,EC
AA  135 DATA 0A,A2,00,BD,0D,08,9D
    ,20,09,E8,E0,04,D0,F5,A5,23
F1  136 DATA 18,69,04,A2,1C,A0,09
    ,20,BD,FF,A2,08,8A,A0,00,20
2D  137 DATA BA,FF,20,C0,FF,4C,96
    ,09,2C,50,2C,52,A2,01,8A,A8
90  138 DATA 20,BA,FF,A5,23,A0,09
    ,A2,1C,20,BD,FF,A9,01,85,F8
C5  139 DATA A9,08,85,F9,A9,F8,A2
    ,20,A0,09,4C,D8,FF,A2,6C,A0
92  140 DATA 09,20,85,09,20,E4,F
    ,C9,4E,F0,0A,C9,59,D0,F5,20
E2  141 DATA F2,0B,20,11,0B,A9,0
    ,4C,D2,FF,A0,09,A2,30,20,85
54  142 DATA 09,A9,00,85,23,20,C
    ,FF,C9,0D,F0,0C,A4,23,99,1C
70  143 DATA 09,C8,84,23,C0,0F,D
    ,ED,A5,23,D0,03,4C,78,0A,60
AF  144 DATA A2,0E,BD,5C,09,9D,0
    ,08,CA,10,F7,20,C9,09,20,4F
68  145 DATA 0B,20,32,0B,20,CB,0
    ,AD,C7,0A,85,03,A9,00,85,02
C5  146 DATA 20,94,0A,A5,21,8D,3
    ,03,A5,22,8D,3D,03,A5,02,8D
A0  147 DATA 3E,03,A5,03,8D,3F,0
    ,A9,03,85,C4,85,AF,A9,3C,85
87  148 DATA C3,A9,40,85,AE,20,0
    ,09,A9,07,85,C0,20,CA,FC,EA
51  149 DATA 03,F4,20,22,0A,A9,0
    ,18,85,C3,65,02,85,AE,AD,C7
9C  150 DATA 0A,85,C4,65,03,85,A
    ,20,22,0A,A9,07,85,C0,20,93
69  151 DATA FC,4C,75,0B,0D,46,5
    ,4C,4C,21,0D,00,00,20,D2,FF
D2  152 DATA A9,0D,4C,D2,FF,A9,0
    ,20,D2,FF,00,00,EE,0F,F4,A9
3F  153 DATA 0C,8D,21,D0,A9,0F,8
    ,20,D0,4C,75,0B,EE,03,F4,A2
78  154 DATA 00,BD,11,0F,9D,10,01
    ,E8,D0,F7,A2,34,BD,78,0F,9D
2C  155 DATA 00,03,E8,D0,F7,EA,EA
    ,A2,FF,9A,A9,20,85,2D,38,E9
94  156 DATA 01,85,FE,A9,12,85,2
    ,E9,00,85,FF,A9,CE,85,FC,A9
AC  157 DATA 0E,85,FD,AD,21,D0,85
    ,FB,4C,52,01,00,00,00,00,00
6C  158 DATA 00,00,19,08,0A,00,97
    ,35,33,32,38,30,2C,31,35,3A
11  159 DATA 97,35,33,32,38,31,2C
    ,31,32,00,27,08,0B,00,99,C7
02  160 DATA 28,48,C6,FC,A5,FC,C9
    ,FF,D0,02,C6,FD,68,60,48,AD
3A  161 DATA 20,D0,49,03,8D,20,D0
    ,C6,FE,A5,FE,C9,FF,D0,02,C6
10  162 DATA FF,68,60,A0,00,B1,FC
    ,C9,F4,D0,18,EA,EA,EA,20,30
DA  163 DATA 01,B1,FC,AA,20,30,01
    ,B1,FC,91,FE,20,3D,01,CA,D0
53  164 DATA F8,F0,05,91,FE,20,3D
    ,01,A6,FC,CA,86,FC,E0,FF,D0
B8  165 DATA 02,C6,FD,A5,FE,C9,1F
    ,A5,FF,E9,08,B0,C8,A5,FB,8D
77  166 DATA 20,D0,A9,37,85,01,20
    ,60,A6,20,8E,A6,A2,1F,BD,10
AF  167 DATA 01,9D,00,08,CA,D0,F7
    ,A9,F4,4C,34,03,4C,AE,A7,00
B5  168 DATA A9,00,A8,85,FB,85,FD
    ,A9,80,85,FC,A9,08,85,FE,B1
77  169 DATA FB,91,FD,C8,D0,F9,E6
    ,FC,E6,FE,A5,FC,C9,A0,D0,EF
A3  170 DATA A9,08,AA,A8,20,BA,FF
    ,A9,0E,A2,F4,A0,87,20,BD,FF
5C  171 DATA A9,01,85,2B,A9,08,85
    ,2C,A9,2B,A2,B0,A0,0F,20,D8
7A  172 DATA FF,4C,66,FE,44,49,53
    ,48,2D,54,55,52,42,4F,54,41
64  173 DATA 50,45,EE,EE,EE,EE,EE
    ,EE,EE,EE,EE,EE,EE,EE,EE
94  174 :
95  175 :
F8  176 :::::::::::::::::::::::::
    :::::::::::
8E  177 :  DISK-TURBOTAPE     BY L
    ES ALLAN   :
C2  178 :
                      :
40  179 :  28 ATKINSON DRIVE  NEW
    PORT  IW   :
C8  180 :
                      :
72  181 :  DISK-TURBOTAPE     BY L
    ES ALLAN   :
36  182 :::::::::::::::::::::::::
    :::::::::::
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Nano-Data, Ulefossveien 40, P.O. Box 830 Hjellen N-3701, Skein, Norway (035) 27-632/23-170

Commodore of Australia, 67 Mars Road, Lane Cove, N.S.W. Australia 011-61-2-427-4888
Beam Scope Canada, Inc., 110 Commander Blvd., Scarborough, Ontario M1S 3H7, Canada 416/291-0000

Amiga News

Future Sounds

We must apologise for not giving a price or contact for Futuresound in our last issue. Thanks to those who called and reminded us! The Futuresound sound sampler for the Amiga is available from Tri Computer Software. It costs £170 + VAT which comes to £195 including delivery to your door. See touchline for the full address details.

Database by Design

A very interesting demonstration of a brand new database for the Amiga has come our way. Available from Taurus Impex, the Acquisition database appears to excel in both presentation and user friendly behaviour, including 'cut and paste' of data between fields. Graphic images can be stored as well as more conventional text, date and numeric data. A single field can contain a picture or document.

A 'mapped filing system' allows both relational and hierarchical filing structures, in combination if required. Up to 16 files can be handled in one application.

The Acquisition editors follow full design of both data format and data presentation. Data is manipulated in one tier and placed in reports in another. A 190 function database language called ACOM allows direct setup and automatic control of the database. Apparently Acquisition can read and write information to and from other software.

Acquisition is being aimed both at non-programmers and professionals who need to build turnkey database systems.

Professional Page

Gold Disk, whose Pagesetter and LaserScript software make up the only true Amiga desk top system, are launching a professional DTP system called Professional Page. Running on any Amiga with 1Mbyte of memory, Gold Disk intend it to compete with other major players in the microcomputer field.

The software will include powerful tools found in high-end DTP systems such as WYSIWYG word processor, algorithmic and discretionary hyphenation, text runarounds, typesetting (kerning, tracking leading and baseline shifts) and a page layout system.

Three new features however will mark the Amiga software apart. Colour picture information up to 256 colour or 4096 in HAM (hold and modify) mode, is maintained within the system. Pictures are displayed as grey level half-tones. An add-on module will allow for colour correction, and mechanical as well as four-colour separations for offset printing. Images, regardless of size, will be displayed in the full resolution of the output device. Pages can be manipulated and combined with other pages before printing and can be rotated to any angle, sizes, moved and reflected at will.

Gold Disk launched Professional Page at the June '87 Comdex show in the USA. They intend to provide a strong technical support program and to publish a newsletter, the New Laser Times, for Gold Disk product owners.

Chatting over the Keyboard

Jenday Software have updated their 'Conversation with a Computer' which we looked at in the first Your Amiga. It remains a unique product with four logic games for entertainment, speech throughout and fully annotated listings in BASIC. The AI techniques involved in the games are explained. The new disk contains well commented source code in C and the whole package can serve as a beginner's level introduction to C for BASIC users. The software also explains a method of calling compiled C routines from BASIC.

If you enjoy programming then Conversation with a Computer is an excellent introduction to many aspects of working with the Amiga.

Display Debate

The Amiga is obviously stirring both manufacturers and owners to action concerning how to actually observe the famous graphics quality. This is because the A500 is being sold with and without monitor. G. Slade from Crewkerne has written to Your Amiga saying that he bought an Amiga 500 from Busbyte (Hobbyte) at their stall at the Commodore Show in London, but only after he had been promised a TV modulator the following week. It transpired that Busbyte could not deliver. A phone call to Commodore revealed that they had 'more modulators than computers'. Mr Slade rang Busbyte again with the good news. They phoned Commodore who by this time changed their minds. They were ordering modulators. The moral of this story is don't leave the shop without monitor or modulator because the stylish grey hardware can get boring on its own!

Good news for owners of CBM 1901 monitors. Trilogic can convert the 1901 for use with the Amiga so that it can display any of the 4096 colours. The 1901 was intended for use with the C128 and has video and RGBI inputs. By adding a SCART (euro) socket, plus other modifications and a special lead (including audio), Trilogic can realise the full colour, medium resolution capability of the monitor.

The price of the upgrade is £24.96. Mail order upgrades will cost a further £15.00 for datapost delivery (remember to send your monitor by insured post of some kind). Those in the Bradford area can of course call in at the following address: Trilogic, 329 Tong Street, Bradford, BD4 9QY. Tel: 0274 684289.



Karate Game

Eidersoft have launched two items of Amiga hardware and a new game, Amiga Karate. The martial arts game features stereo effects, two player option and many levels of increasing difficulty. Realism is added by carefully chosen sound samples from the real karate world as well as subtle background effects. Instructions will be in English, French and German, but not Japanese!

On the hardware front, Eidersoft's sister label Triangle have an add-on 3.5" disk drive which comes complete with demo disk and public domain software. There is also Pro-draw, a 9x6 inch graphics tablet costing £59.95. Pro-draw works with Deluxe and Aegis packages as well as its own software (£14.95).

Microprose Latest

Following the release of Silent Service, Microprose have announced future availability of Ultima IV, Autoduel and, the impending release of Super Huey. Autoduel is a futuristic strategy, role-playing game based on the American award winning 'Car Wars' board game by Steve Jackson.

Superbase Award

The Software Showcase Productivity Award given by the Summer Consumer Electronics Show in Chicago has gone to Superbase Personal from Precision Software. The award is for the Amiga, Atari and PC versions. Superbase gained special praise for its external file management system which allows applications created with other programmes to be retrieved and displayed next to their database record.

Kickstart Guide

Adriadne Software, who published the technical magazine for Amiga software developers, have released edited highlights for us 'general public' in the form of The Kickstart Guide to the Amiga; 260 pages of introduction mainly to the system software and to C and assembler programming but with a hardware overview. Although aimed at those who do not know the Amiga, the book remains pretty technical, a must for everyone who is going to write software for the Amiga, for profit or fun.

Produced in a large A4 format, the book costs £12.95 (85p postage). Details from Ariadne on 01-960 0203.

Toolkit Extras

Metacomco have released a new version (1.2) of their Metacomco Toolkit. The toolkit of 11 AmigaDOS commands, including powerful Unix based Make and Touch utilities. Others are Pipes, Librarian, Disassembler, Auxilliary CLI, Mount, Browse, Enlarge, Pack and Unpack. Price is £39.95.

Barbarian Twins

Following the release of Psygnosis' Barbarian – reviewed this issue – Palace Software have announced an Amiga version of their Barbarian. The programmer and music specialist of hit program Cauldron are behind the project. Barbarian contains two games. Having perfected your swordmanship against computer or other player in part one, you go on to fight to save the Princess from the clutches of the dark sorcerer, Drax.

The Barbarian is capable of sixteen different moves including headbutt, kick and web of death. Should we mention the decapitation? Price undecided. Details from Palace on 01-278 0751.

Ray Tracer

Have you seen the much vaunted Juggler demo which all Commodore dealers seem to have running in their window? Well, it's the work of Eric Graham and involved countless calculations, at least an hour's processing and a program called Ray Tracer. The software is now available through the Amiga Centre Scotland. Ray Tracer lets you create your own spectacular pictures and a competition is to be announced for the best results. There is also a ray tracing newsletter which will be available from the Amiga Centre Scotland. Also available soon will be Eric Graham's Sculpt 3D.

WordPerfect

WordPerfect, which is claimed to be the biggest selling wordprocessor for IBM PCs and compatibles with over 600,000 users worldwide, is now available for the Amiga. The new version takes advantage of the Amiga environment with pull-down windows, multiple documents in memory, windows and mouse control.

WordPerfect is available in the UK from Sentinel Software and over 2,000 dealers, priced at £295. Features of the Amiga version include a 115,000 word dictionary, the biggest on Amiga so far, full feature thesaurus, text columning, line drawing, sorting, footnotes and endnotes. More sophisticated capabilities included are mailmerge, automatic backup,

'undelete', contents/index generation and user creation of macros to replace repetitive series of keystrokes. Details on 0932 231164.

Also launched is Prowrite, New Horizon's wordprocessor capable of flowing text around graphics and working in high resolution. We intended to review this issue but the software crashed on our 1000s, working only on an A500. Explanations, we hope, next issue. With the other newcomer Vizawrite, the wordprocessor competition is really hotting up.

Amiga at Work

More news from Commodore of the Amiga out in the field. How about these for a varied set of computer uses. Guy's Hospital are using the Amiga as an aid in the assessment of artery performance. Ultra-sound is shone on the moving blood and the reflected signal recorded. The Amiga is used to speed the analysis of the recorded data, comparing recorded wave shapes with known normal shapes to work out what is wrong. Amiga then presents the assessment as a graphic printout of a man with arteries colour-coded, depending on the degree of obstruction.

Supergas, who sell liquified petroleum gas in cylinders are setting up a real-time telephone order taking and sales ledger system using Amigas connected to their mini computer.

The British Aircraft Corporation Space and Communications department use their Amiga to perform stock and structural analysis. The Amiga has become the intelligent 'front end' to the system, providing hi-res diagrams where once slow plotters had to be used and allowing further interrogation and analysis of data.

Pharmaceutical company, Upjohns of Crawley, Surrey, use the Amiga to analyse laboratory data from a digital oscilloscope on the RS232 port. Their next project is to use the Amiga for image analysis by digitising pictures.

Dr Alan MacFarlane, a Reader in the Department of Social Anthropology at Cambridge University, is working on a database for the storage of large archives, extending it to work with anthroplogical material and preparing the first Cambridge experimental video disk. The hi-tech LV ROM disk player will contain information on the headhunters of India's N.E. frontier, from the beginning of time to 1947.

Using a PAL Genlock, Dr MacFarlane will combine a collection of photographs, letters, diaries and similar material onto video disk. Diagrams generated by the Amiga can be superimposed upon video or photographic footage. The information will be available for talks and lectures and will become a permanent, though mobile, archive.

SAM Multitasking Basic

Parkway Computer Consultants have developed an alternative to Microsoft BASIC with program segments and a multi tasking executive. For serious programming SAM also provides commands for windows, menus and event handling.

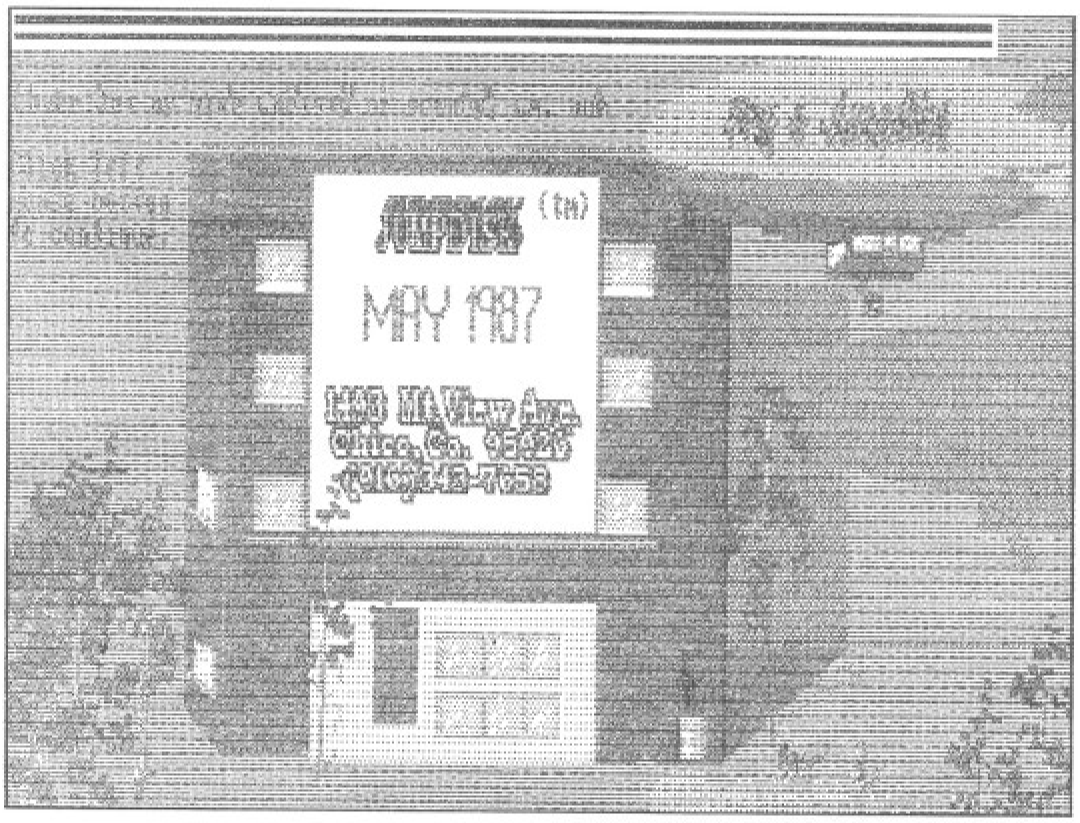
Dancing Disk

Having spent an enjoyable couple of evenings investigating the US monthly Amiga disk magazine Jumpdisk, I was pleasantly surprised to find out that a UK distributor has taken up the cause. The May issue I checked out was a good 50/50 of articles and general interest programmes.

The Jump Disk menus make up articles or programmes, which are mainly in BASIC, easy to activate. All the programmes have full articles associated with them which adds to the enjoyment and you can list the programmes and pick up ideas. Some of the games are pretty professional and the graphics demos excellent. Jumpdisk can be obtained from George Thompson Services Ltd., Old Reigate Road, Betchworth, Surrey, RH3 7DR. Tel: 073-784 4675.

Also now available is Eartype, the first in a series of 'Jumpdisk presents' software. Eartype is a word processing program recommended for the blind and sight impaired. It uses the Amiga voice as an aid in writing. It is also useful for learning to type and could assist children learn the alphabet and spoken English. The price of Eartype is a very reasonable £5.00 inclusive, reduced to £3.00 for orders placed by registered blind users. All profits made from the sale of Eartype will be donated to a current appeal for the blind or sight impaired.

Another disk based magazine not yet marketed here is Aladdin, a very classy 20 dollar, two disk pack with top name correspondents interviewing stars, film reviews – complete with digitised pictures! – cartoons, reviews, software, recipes, self-improvement advice, business, fiction and some genuinely original computer art. The jingles and graphics are top class and there is plenty of humour, including a 'question the president' session with a digitised Ron and Nancy. It's a flash production and the prose is entertaining but it's not the right material for the medium and vice versa.



Commodore at Comet

By the time you read this article your local Comet store should have its special 'demonstration module' installed and a stack of A500s in the storeroom. Commodore announced this first 'high street' deal in mid June and their national sales manager said 'this is the first in a series of multiple retail announcements that can be expected from Commodore in the coming months.'

Television Output

The Amiga A500 is very reasonably priced considering its performance but the price of a colour monitor can push the true system cost much higher. Many users will happily plug their A500 into their television. This is cheaper but a terrible waste of the graphics quality. Triangle Television, specialists in the combination of Amiga and video, have come up with a solution to the problem with their RGB to Video and RGB to RF converter boxes. There are currently five units, BR3 through BR7, which combine to provide either or both video out and RF out.

The convertor boxes take the Amiga RGB output and convert it for a television or for a home video recorder. A valuable offshoot of this is the ability to record the Amiga screen on video tape, a portable way of distributing Amiga artwork and animations. Amiga graphics can of course be used as an opening title screen or for a list of credits on a conventionally shot video.

Triangle's John Clark (Research and Development) says: 'This unit has an innovative design feature which produces what we call "Super RF" and means that the colours and definition are of a very good quality on the home television.'

For A1000 owners who wish to record on video, the units give a cleaner signal than the standard composite out. Prices range from £67.00 to £79.93.

How do I get it?

It's alright us giving you an exotic address and ZIP code for some Los Angeles neighbourhood, but how do you get the software?

1. Check the ads – English Commodore dealers are importing more and more software all the time.
2. Try our contact addresses/telephone numbers.
3. Get in touch with Commodore UK who can supply you with a brochure full of goddies for your Amiga.

Touchlines:

Commodore (UK), Commodore House, The Switchback, Gardner Road, Maidenhead, Berks, SL6 7XA. **Tel:** 0628 770088.

Addison Wesley, Finchampstead Road, Wokingham, Berkshire, RG11 2NZ.

Ahmed Innovations and Research Ltd., 145 Malden Way, New Malden, Surrey, KT3 5QX. **Tel:** 01-949 4422.

Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh, EH1 3RN. **Tel:** 031-557 4242.

Applied Visions, 15 Oak Ridge Road, Medford, MA 02155. **Tel:** 617-488 3602.

Ariadne Software, 273 Kensal Road, London, W10 5DB. **Tel:** 01-960 0203.

Arithmos, Tweedvale Cottage, High Cottages, Walkerburn, Peeblesshire, EH43 6AZ. **Tel:** 089-687 583.

Cavendish Commodore Centre/UK Amiga Users Group, 66 London Road, Leicester, LE2 OQD. **Tel:** 0533 550993.

Diamond Software, 56 Knightshill, London, SW27 OJD. **Tel:** 01-761 7965.

Eidersoft, Hall Farm, Nr. Ockenden, Essex, RM14 3QH. **Tel:** 0708 856468.

Felsina Software, 3175 South Hover Street, Los Angeles, CA 9007.

George Thompson Services Ltd, Whitegates House, Old Reigate Road, Betchworth, Surrey, RH3 7DR. **Tel:** 073-784 4675.

Gimpel Software, 3207 Hogarth Lane, Collegeville, PA 19426. **Tel:** 2155844261.

Gold Disk, PO Box 789, Streetsville, Mississauga, Ontario, L5M 2C2. **Tel:** 416-828 0913.

HB Marketing Ltd, Pier Road, North Feltham Trading Estate, Feltham, Middlesex, TW14 OTT. **Tel:** 01-844 1202.

JDK Images, 2224 East 86 Street, Suite 14, Bloomington, Minnesota 55420. **Tel:** 612 854 7793.

Jenday Software, PO Box 4313, Garden Grove, CA 92642.

Kuma Computers Ltd, Pangbourne, Berkshire, England. **Tel:** 07357 4335.

Meridian Software, PO Box 890408, Houston, TX 77289-0408. **Tel:** (713) 488 2144 (USA).

Metacomco, 26 Portland Square, Bristol, BS2 8RZ.

MicroEd, PO Box 444005, Eden Prairie, Minnesota 55344. **Tel:** 612 944 8750.

Microprose Software, 2 Market Place, Tetbury, Gloucestershire, GL8 8DA. **Tel:** 0666 54326.

New Horizons Software, PO Box 43167, Austin, TX 78745. **Tel:** 512 329 6215.

Parkway Computer Consultants, 3 Mundells Court, Mundells, Welwyn Garden City, Herts, AL7 1EN. **Tel:** 0707 371616.

Precision Software, 6 Park Terrace, Worcester Park, Surrey, KT4 7JZ. **Tel:** 01-330 7166.

Rainbird Software, 74 New Oxford Street, London, WC1A 1PS. **Tel:** 01-240 8838.

Sentinel Software, Wellington House, New Zealand Avenue, Walton-on-Thames, Surrey, KT12 1PY. **Tel:** 0932 231164.

Taurus, Taurus House, 3 Bridge Street, Guildford, Surrey, GU1 4RY. **Tel:** 0483 579399.

Triangle Television, 130 Brookwood Road, London SW18 5DD. **Tel:** 01-874 3418.

Tri Computer Software Ltd, 31 Oak Green, Tanners Wood, Abbots Langley, Watford, Herts. **Tel:** 09277 69081.

Trilogic, 329 Tong Street, Bradford, BD4 9QY. **Tel:** 0274 684289.

Viza Software, Chatham House, 14 New Road, Chatham, Kent, ME4 4QR. **Tel:** 0634 45002.

Y2 Computing Ltd, Tarmay House, 146-150 St. Albans Road, Watford, Herts, WD2 4AE. **Tel:** 0923 50161.

Club Amiga, 85 Upper Drumcondra Road, Dublin 9, Ireland.

Independent Commodore Products Users Group, 57 Gunnersbury Avenue, Ealing, London, W5 4LP. **Tel:** 01-993 2634.

Local Commodore Business Centre on 0536 205555.

High Voltage, 53-59 High Street, Croyden, Surrey, CR0 1QD. **Tel:** 01-681 3022.

AB Computers, 173 Thornbury Road, Osterley, Isleworth, Middlesex, TW7 4QG. **Tel:** 01-568 7149.

Computatill Ltd, 77/79 Chadderton Way, Oldham, OL9 6DH. **Tel:** 061-652 8006.

Analyze — a Spreadsheet for the Amiga

Commodore designed the Amiga to be a business machine, as well as a CAD/CAM workstation and a games machine. One of the main applications for micros in business is the spreadsheet, so just how successfully have these been implemented on the Amiga to date?

By Alan Solom

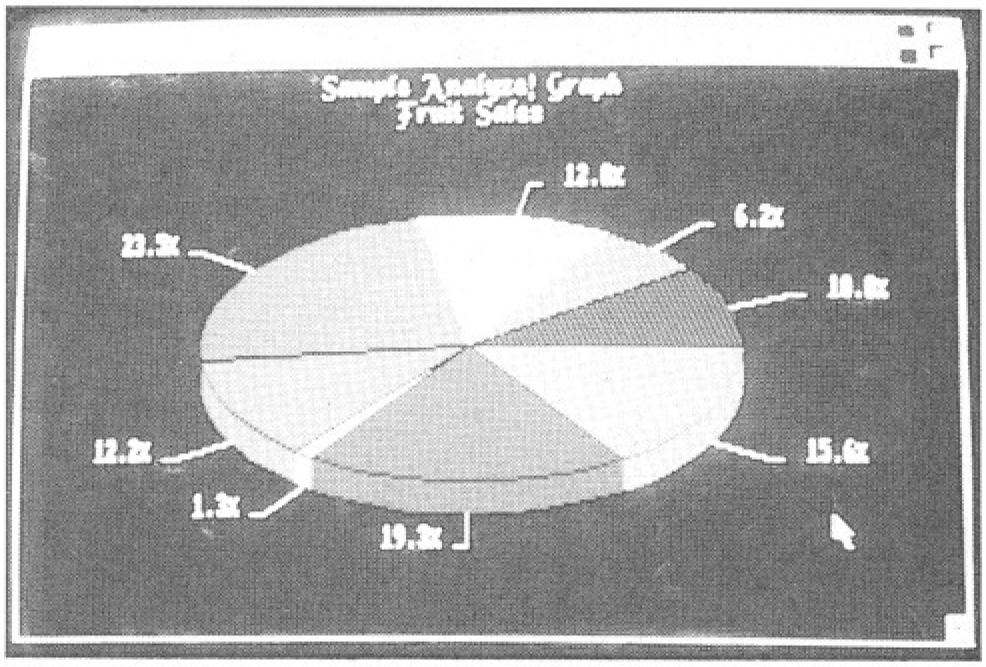
The three main Amiga spreadsheets are *Logistix, VIP Professional* and *Analyze. Logistix is poor* – it requires a dongle in one of the ports to operate, and then it is slow to move around, slow to recalculate and doesn't seem to recognise the existence of a mouse. Grafox, the company responsible, admits to rushing it out and will be releasing a much improved version later on.

VIP Professional looks rather better, but we haven't had a chance yet to look at it in detail, as there seems to be availability problems.

The Third Option

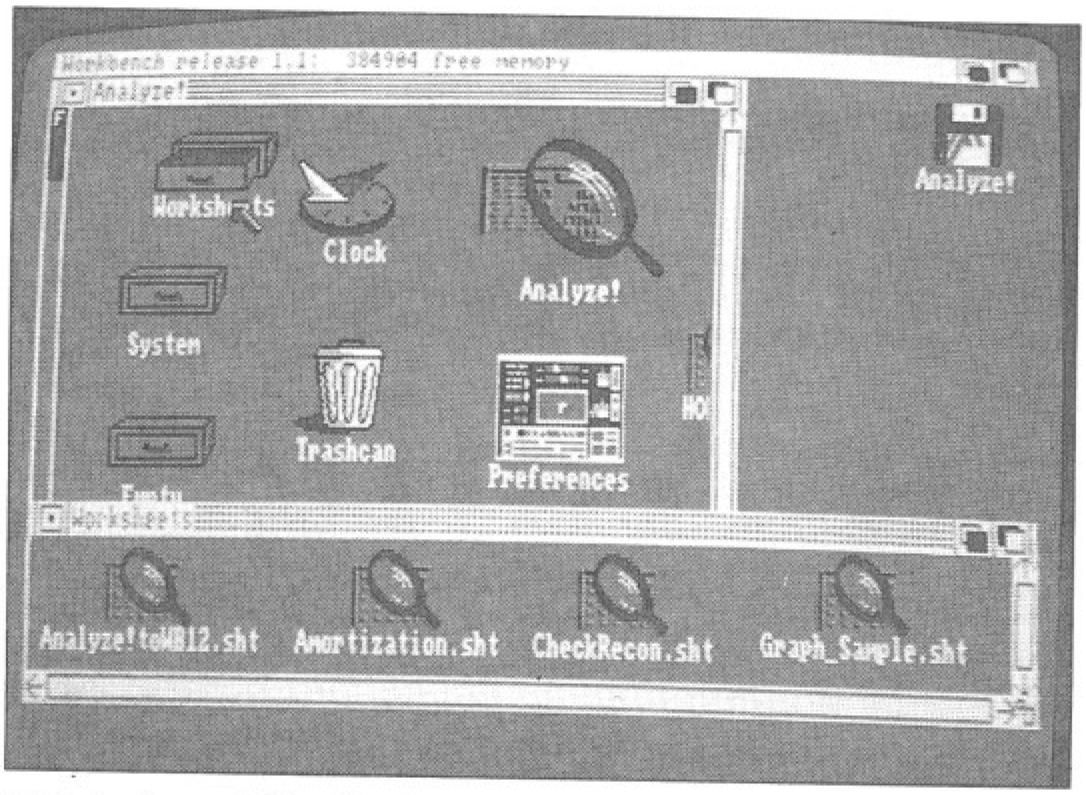
We looked at Analyze in detail. The first thing we did was to copy the diskette, so that we could put the original safely away, as recommended by the Analyze manual. As Analyze isn't copy protected, this is very straightforward.

When you click on the Analyze icon, a requester pops up asking how much memory to use for the



spreadsheet, and suggesting 128K. Theoretically if you ask for too much, the requester stays up, but in practice the requester goes away, and you have to click on Analyze again.

Sometimes, the whole screen goes blank, and you have to refresh it before you can try again. It would have been better if the requester told you the maximum space available for the spreadsheet, as they tend to be very memory-hungry applications. Our



512K Amiga wouldn't allow 256K of memory, but when we requested 200K, it happily let us into the spreadsheet.

Lotus 123 Similarities

At this point, we had a very pleasant surprise, Analyze is very reminiscent of the old version 1a of Lotus 123. This has been a major best seller on the IBM PC, and quite rightly, as it has all the functionality that a business user requires.

MSS have not copied the full 'look and feel' of 123, which has turned out to be a wise move, as Lotus are suing two US software houses for doing this on the IBM. They have adapted the 123 user interface so that it is more suited to the Amiga, but in our opinion, they have not gone as far as they could have.

To load an existing spreadsheet, you bring up the menu with the right mouse button, as usual. You choose Project, then Archive, and the requester that pops up lets you get an old spreadsheet. Each spreadsheet has a comment next to it, which is for describing its contents; much more helpful than just a filename.

The Archive requester also lets you Store a spreadsheet you have just started up, or Replace an existing spreadsheet with a new version. You can also use this requester to move between directories, and delete unwanted files.

MSS provide a few simple spreadsheets on the disk, to show you what is possible. It would be a good idea to start off by loading one of these, and changing it around, to get the idea of a spreadsheet, and to get the feel of Analyze.

The end product of most spreadsheets is a report on paper. So Analyze gives you various ways to format your output, and you can then print it either directly to your printer, or else to disk, so that it can be incorporated into some larger document.

Cells can be formatted in several ways. The default is General, numbers are displayed in the most natural way. But you can change the format either for the whole spreadsheet, or for a range of cells.

Fixed gives a fixed number of decimal places
Scientific uses the E (exponential) format, and is suitable for very large or very small numbers.
Currency puts a dollar sign in front of figures, and puts negative numbers in brackets. It also uses a comma to separate thousands. There's no way to get the pound sign.
Commas is like currency, but without the dollar sign.
Percent displays the value times 100, followed by a %.
+/- can be used to create a simple bar chart.
Text displays the formula, rather than the result of the formula, and is useful for documenting the spreadsheet.
Date is used for formatting the date.

Having formatted the output, you can then print it. Analyze lets you choose the range you want to print, allows you to define headers and footers for each page, define the page width and length, and send the printer a set-up string so you can put your printer into NLQ mode before starting the print (or whatever else you want). so it is possible to set up attractive reports, and incorporate these into a major document.

For a report with more impact you might choose to display the figures in one of three graph types, pie, bar and line. The graph data is entered in sequence by choosing data from the spreadsheet. This can involve as little as clicking the mouse on an individual cell. Explanatory text is entered in a parallel sequence. The graphs are rapidly drawn in a new window.

Manoeuvrability

One of the most important factors affecting how nice a spreadsheet is to use, is how easy it is to move around in it. Lotus 123 is very easy to move around, even without a mouse, because of all the different ways there are for navigating the cursor around the spreadsheet. Analyze gives you a few ways, and they are badly insufficient.

The most obvious way is to use the cursor control keys and this will move the cursor around the displayed screen changes to reflect the new position, but it doesn't try to refresh the screen immediately (as per 123). It just refreshes the row numbers, until you take your finger off the cursor, and then the whole screen is updated. This speeds things up quite a lot, compared with the way Lotus did it. But it still feels rather slow.

You can also move around using the mouse, but this has not been done very well. You can only move around within the screen currently displayed; you can't move off the bottom and expect the screen to scroll in the same way as you can with the cursor controls. This is a major limitation, as it means that the mouse is almost useless for moving around, as spreadsheeting usually involves moving large distances. It's hard to see why MSS didn't let you move off the bottom with the mouse, or provide scroll bars, or let you drag the screen, or something.


AMIGA





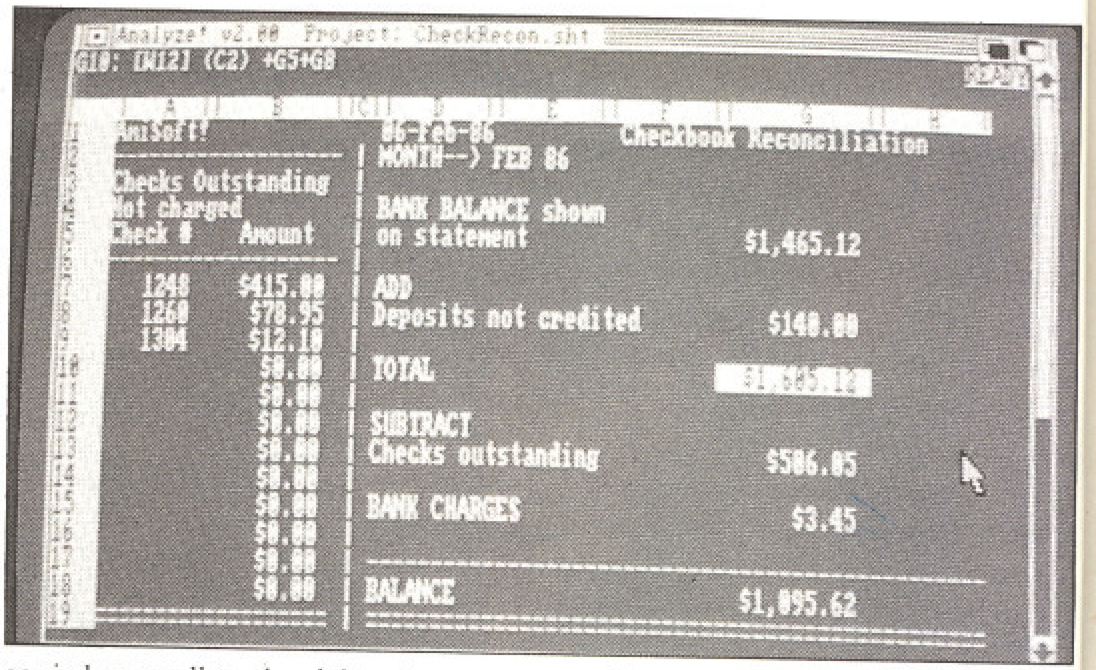
Even using the cursor keys, there are big limitations in your freedom of movement. You can move up and down a page at a time, using Shift-arrow keys, but there is no fast way to move right or left, a page at a time. It is a big pain that spreadsheets tend to be wide rather than deep. One of the most useful navigation keys in 123 is the End key, which mgnifies any arrow key so that the cursor moves to the end of the row or column. There is no equivalent in analyze. There is only one method provided for making large jumps around the spreadsheet, and that is to use the Goto key (F5) to move directly to the cell required. But this is not the intuitive way to move around, and very few Lotus users move this way, even though this method is available in 123. We think that MSS should put a LOT more work into the different ways of moving around the spreadsheet.

Entering data into Analyze is easy – you simply type the number, formula or label into the cell. It is also easy to replicate cells, using Copy. Copy can be invoked by using the mouse to bring up the menu, and choosing Range Copy, or by hitting C while holding down the right Amiga key. Since the mouse isn't very useful for moving around the spreadsheet, you'll probably use Amiga-C, as it feels better to stay on the keyboard than to keep switching between that and the mouse.

You can then type in the range you want to copy from (such as D1 .. E6) and then the range to copy to. But it's more natural to point to the 'from' and 'to' ranges. To do this, you move the cursor to the start of the from-range, press the . key (this anchors one end of the cursor), then you move the cursor to the far end of the from-range. As you move it, the cursor expands, showing you the calls you've chosen to copy. When you get to the far end, you press RETURN and Analyze asks you where to copy these cells. You move the cursor to the top left hand corner of the area you want to copy to, and press Enter, and the range is copied.

This is all very simple and intuitive in action, but could be made easier by a wider variety of movement methods.

People who have never seen spreadsheets in action before are always pleasantly surprised by the way that formulae adjust themselves when copied, so that they are still correct. So that if a formula that refers to C2 is



copied one cell to the right, the copy refers to D2 and all is right with the world. Most of the time, this is how you want it to work, but sometimes, you don't.

So you can put an absolute (as opposed to a relative) reference into a cell. This is done by using $ in the formula. So C2 in a formula means that even when it is copied, the copy will still refer to cell C2. You can also have mixed references, such as $C2 – when this is copied, it will always refer to column C, but the row number will be adjusted. Similarly, you can have C$2.

Another feature that serious spreadsheet users think is vital, is what is called 'natural' recalculation order. Some spreadsheets allow the recalculation to proceed row by row or column by column. This means that if you refer to a cell below and to the right, the spreadsheet will get the answer wrong, unless you recalculate according to their dependencies, in the way that you would expect. Analyze uses natural recalculation order, although you can tell it to work row wise or column wise. Recalculation is normally automatic; every time a cell is changed, the spreadsheet recalculates. But when a spreadsheet grows large, recalculation can take a long time, so Analyze provides a Manual recalc – you can enter a lot of data, and then hit the Recalc (F9) key.

Analyze provides all the formulae that you are likely to need, as well as a number you're not likely to need (such as Arctan). The usual functions such as @ SUM, @ AVG (average), @ SQRT are all there, as well as financial functions like Future Value, Net Present Value, and Present Value.

You can also create your own functions with HLOOKUP, which lets you set up a look-up table, and you can return values from the table that depend on the index you supply. This is very useful for tax tables, or payroll calculations, where the answers are not smooth formulae, but can best be represented as a look-up table. VLOOKUP is the same thing, but the table is a column of cells instead of a row.

Another powerful feature is @ IF, as this lets you return one value if the condition is true, and another if it's false. You can create conditonals to test using the usual equality and inequality tests, and you can then combine them using #NOT#, #AND#, and #OR#.

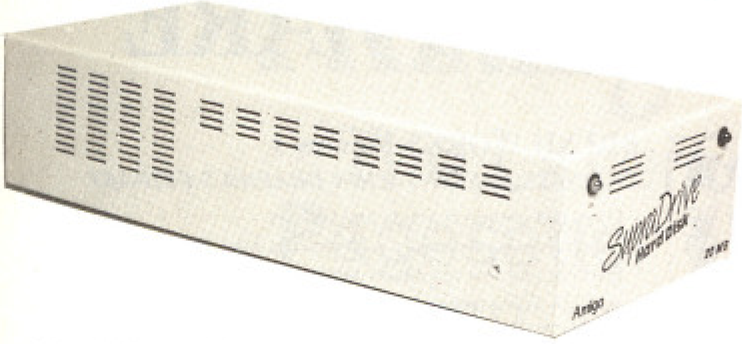
Conclusion

If we wanted a spreadsheet, and a computer to run it on, we would not choose Analyze on the Amiga. But if we had an Amiga and needed a spreadsheet, Analyze is a quite serviceable product. Most importantly, at no time during its use were we invited to meditate on some strange number, with consequent loss of all our work – that would be the most unforgiveable sin, and it did not happen. But the means of moving around the spreadsheet should be improved, as that should not be too big a programming job.

Touchline:
Name: *Analyze.* ***Price:*** *£1.99.* ***Supplier:*** *Precision Software (Micro Systems Software).* ***Tel:*** *01-330 7166.*

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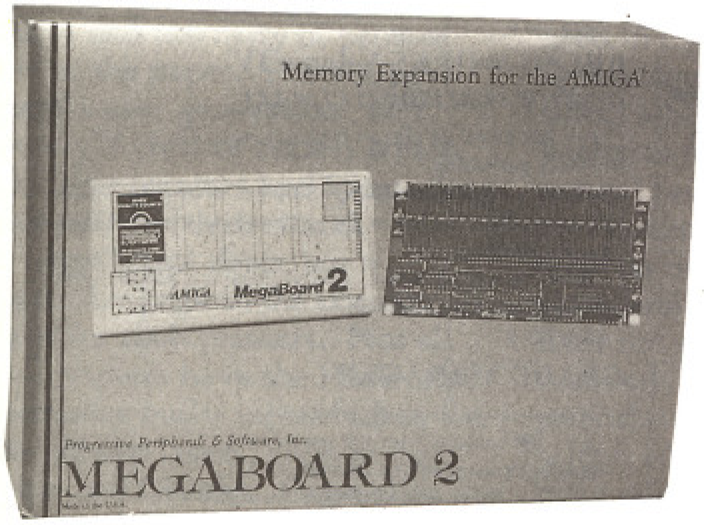
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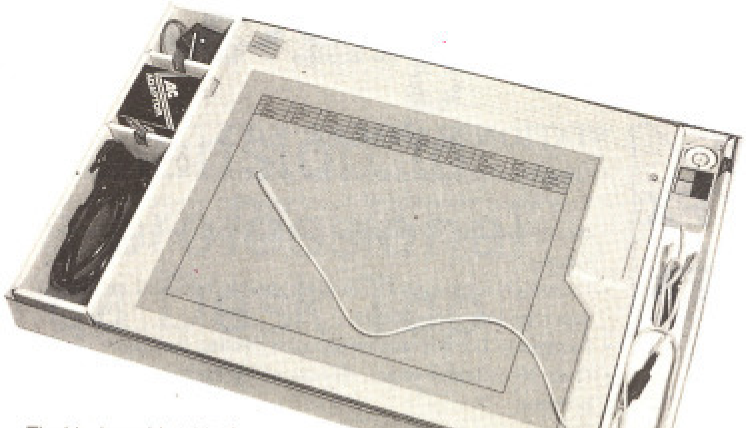
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MegaBoard 2 is a reliable new low-cost 2 MB RAM expansion unit which plugs onto the Amiga's bus expansion connector. **MegaBoard 2** comes fully populated and can be auto-configured with AmigaDos Version 1.2. One of the fast RAM units available, **MegaBoard 2** allows better use of memory oriented software —Aegis Animator, Draw Plus, Deluxe Video, etc — and RAM disk for fast copying and handling.

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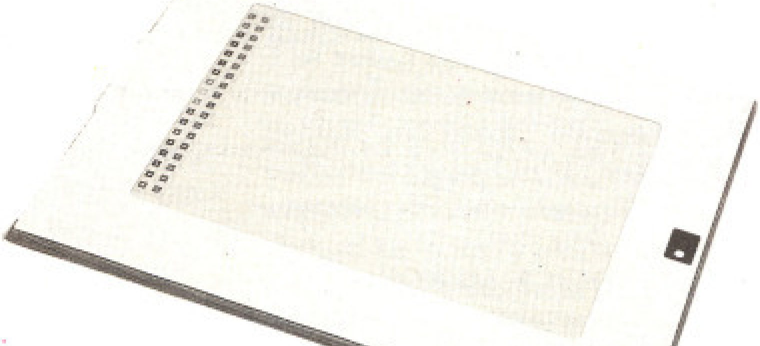
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Precision Software Ltd., 6 Park Terrace, Worcester Park, Surrey KT4 7JZ
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Dealer enquiries welcome!

All prices are exclusive of VAT

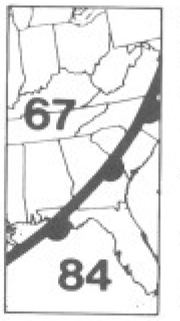
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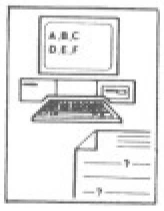
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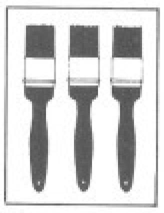
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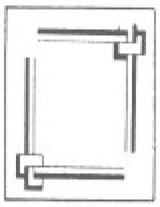
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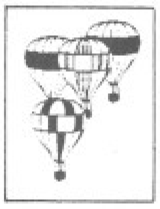
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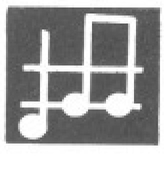
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FOR AMIGA COMPUTERS

Printing in Laser Light

The LaserScript extension to Pagesetter offers a professional option to the Amiga Desk Top Publisher

Gold Disk have released an important extension to their Pagesetter software, the LaserScript package which acts as an interpreter for any laser printer which understands the Postcript page description language.

Pagesetter, like other graphics based programs, usually prints the screen page on a dot matrix printer, translating the dots seen on screen into the appropriate pattern and intensity of printed dots on the paper. Postscript is one of a new generation of languages (sets of codes) which both laser printers and typesetting machines can understand.

LaserScript describes a Pagesetter page in the correct codes for such printers. Not all laser printers have the Postscript interpreter built- in, including the latest cheap lasers, such as the Epson and Citizen. Pagesetter can certainly "dump" its pages to these printers but even LaserScript will not be able to "describe" them.

Postcript Power

What is the difference then? LaserScript will allow Pagesetter pages to use high quality typesetting fonts like Helvetica, Times, Courier and Symbol. These are supplied in 8, 12, 16 and 24 point sizes and there is a utility to convert to other point sizes as required. Some laser printers are powerful computers themselves and contain a number of fonts in ROM. The full resolution of the laser printer or typesetter will be used, not the resolution of an Epson dot matrix emulation.

LaserScript also allows you to stack Pagesetter pages onto just one custom designed page. You can create "forms" which are templates for the Pagesetter pages. The Postscript language can be used to create all sorts of typesetting effects such as grey tints, white text on black background and text printed in a curved fashion.

Postscript is a full language with its own commands and structures. However LaserScript does not supply the language in a form which is programmable but provides a front end "studio" in which you choose typefaces and page design. Laserscript then translates the appropriate Pagesetter pages and sends the correct Postscript codes to the printer.

This text is a Pagesetter page printed on a dot matrix printer. We have used the Times typeface in different sizes, the Courier font in 12 point and there is an example of the PSymbol (special character) font at the end of the page.

These fonts can be copied to the Pagesetter disc or, with a two drive system, become the default fonts by inserting the LaserScript disc at the Workbench prompt. The same file, once proofed, can be imported into Laserscript. The resulting Postscript file is then ready to be printed out on a laser printer or to be sent to a typesetter. The Postscript file can be in a form suitable for despatch via electronic mail, for instance to a typesetting company with a mailbox on Telecom Gold.

Package Deal

Commodore distributors Hugh Symons have put together a Desk Top Publishing package based on the Amiga 500 for the all- in price of just under one thousand pounds. The setup comprises Amiga 500, monochrome monitor, Citizen 120D printer and leads, Pagesetter software from Gold Disk and support. Thus a cheap DTP setup should be widely available through Commodore dealers. Uniquely, for the price, the software allows the user to upgrade to laser printer and even laser typesetter quality with the Laserscript software. Gold Disk are further integrating their Pagesetter software to produce a "professional" DTP package. Effectively that's what you've already got with Pagesetter and Laserscript combined.

Special font

Ξαιρετε. Μιλατε Ελλενικα?

special character set greeting in Greek.

Tools of the Trade

You will need a new assembler when learning to program in 68000 assembly language. We look at three assemblers with subtle differences, but which all produce either executable or linkable code.

By Anne Owen

The ideal assembler and associated software tools are designed to make the writing of code as easy as possible. Requirements include ease of documentation and debugging, the ability to use meaningful lables and different number bases (e.g. binary, octal). When you buy a professional assembler it is also fair to expect lucid documentation and for the beginner to 68000, a basic introduction to the chip.

In actual fact the assemblers looked at here provide different combinations of editor – in which the program instructions (source code) are written; assembler – which takes the assembler instructions and turns them into machine instructions (object code); monitor/debugger – for checking the actions of the instructions; and linker – which takes combinations of object code (created by assembler or high level compiler) and links them together into one file.

Seka

When using Seka, the programmer flicks between a full screen editor and a command window in which single keypress commands invoke both assembly and file management. Various assembly options, such as listing output to the printer, are available.

The neat text editor lacks the sophistication of Ed but is functional. Some two dozen pseudo operators can be inserted in the assembler listing providing things like conditional assembly (IF, IFB, ELSE, ENDIF), macros and printer output.

The debugger can examine memory locations and registers, edit contents, disassemble code and single step through a program. Interesting Seka acts both as assembler and linker, accepting linkable code while assembling source at the same time.

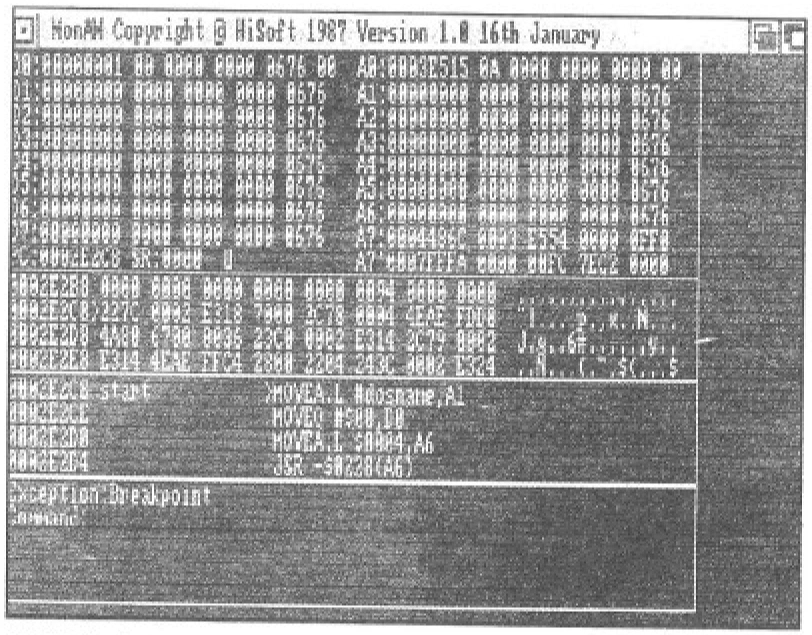
The Seka manual packs alot into its 35 pages including brief appendices on AmigaDOS libraries and 68000 instructions but there is only one short example program.

Devpac

Hi-Soft's Devpac is the lastest assembler release and the first to use Amiga windows and pull-down menus in the editor. Devpac comes recommended from the Atari ST and Hi Soft proudly tell us that Argonaut used Devpac to write Star Glider for ST and Amiga. Devpac provides the editor, assembler and debugger. Pull-down options have key press equivalents and the editor is a window which can be resized and moved around like other Intuition window. Proper requesters prompt for user input and the actions of the assembler can be setup from an 'installation' program as well as from within.

The assembler, Genamiga, includes features such as conditonal assembly, macros, position dependent code (for ROM or other micros), printer controls, title strings and the ability to include standard libraries of code from specified directories. There are conditonal assembly directives such as 'if greater than', 'if string equivalent to other string'. Conditonal assembly is useful for debugging code in test versions and writing for different machines.

The Devpac disk contains a range of include files, much as on the Metacomco disk, but with directives in place of macros and with comments removed. The originals are in the ROM kernal manual. The assembler can be directed by an OPT command to, among others, include debugging information for Genmon, to list to a narrow printer and to



Hi-Soft's Devpac

force position independent code. Each option has both on and off settings.

Genmon, the debugger, lets you set breakpoints, single step through the code, missing out operating subroutines if required – examine and edit memory and registers.

Hi-soft have also provided BLINK, a public domain linker which improves on the ALINK standard. Instructions are found in text files on disk. The version of Devpac I looked at (end of June) was provided with a modified Workbench 1.1 and had a slight problem with Kickstart 1.2. The user has to issue a 'setmap usa0' command before issuing the GENAM command. I had to write an alternative startup-sequence file with Ed.

The Devpac manual is desktop published and comes in a ring binder. It provides a generous number of examples on disk (e.g. using library functions to open a window or startup in Workbench) as well as instructions on setup and syntax. Appendices on AmigaDOS and on the role of libraries in the operating system should prove especially useful for the newcomer. The Motorola 68000 reference guide is sensibly included.

Macro Assembler

To use the Metacomco assembler the programmer writes the instructions in the Ed text editor, which is supplied as part of AmigaDOS. The assembler is then called with the name of the instructions file. The assembler command can take various parameters such as source and object filenames, verification file, header file and equate file. There is a further options parameter and finally the programmer can add a directory list for the INCLUDE command.

Metacomco's assembler has a large number of assembler directives for symbol and data definition, assembly control (e.g. relocate origin, conditional assembly) and listing control (e.g. NOPAGE to turn off paging). There are eight versions of the conditional (e.g. IFD – assemble if a label is defined, IFGT – assemble if expression is > 0). There are directives to change the program counter, to equate labels with symbols, to list selected parts of the code, to set page and line length and to print a program title at the top of each sheet. References to linkable code can be made with XDEF and XREF. INCLUDE combines selected files from disk into the assembly sequence.

The Metacomco manual is stylishly produced in their now standard A5 format. There are sections on the Ed text editor, calling the assembler, controlling the assembly and a brief introduction to the 68000. The assembler directives are individually explained.

Macros

A macro is a labelled set of instructions which generates object code when called. Metacomco's assembler is not alone in supporting macros, both Seka and Devpac have MACRO commands.

However Metacomco are justified in emphasising this aspect of their assembler. The inclusion in MCC's assembler of special text manipulating directives VALOF, STRLEN, LEFT, RIGHT and MID (which work like their BASIC equivalents) means that the macro can be instructed to modify arguments appropriately by testing the contents of strings passed to it.

In both Genamiga and Metcomco's assembler macros are defined within MACRO...ENDM directives with MEXIT allowing a quick exit after a conditional test. By default, macro generated code is not included in a listing but can be switched on by the appropriate directive.

Calls to the macro can pass variable arguments and a special argument can produce unique labels within the macro generated object code. In Metacomco's assembler up to ten previously defined macros can be called from within a macro but nesting is not permitted. In Genamiga up to eight levels of macros can be nested allowing recursion.

Conclusions

These three assemblers reflect the strength of Amiga software in general and offer an excellent choice for the assembler programmer. However none of the manuals attempt to teach assembly programming so beginners will require a suitable book.

Seka is an efficient set of programmes, editor, assembler and debugger, but you will have to become familiar with its way of working. I didn't find this a great obstacle with the programmes, but feel that Seka's poor interaction with the user clouds the abilities of the software.

The Metacomco assembler (£69.95) is a very powerful program with a set of sophisticated assembler controls designed to ease the difficulties of development and documentation. A further plus is the use of Ed, the Amiga text editor, with which you may already be familiar. Experienced 68000 programmers will want to take advantage of this assembler's sophistication.

Devpac (£59.00) provides an 'Amiga style' editor which is easy to use, a comprehensive set of assembler controls and formatting options and a debugger. With its excellently presented manual, Devpac is the best of the bunch for newcomers to the Amiga and 68000.

Touchline:

***Product:** K Seka Assembler. **Supplier:** Kuma Computers, Pangbourne, Berkshire. **Tel:** 0735 74335.*

***Product:** Devpac Amiga. **Supplier:** HiSoft, The Old School, Greenfield, Bedford, MK45 5DE. **Tel:** 0525 718181.*

***Product:** Macro Assembler. **Supplier:** Metacomco, 26 Portland Square, Bristol, BS2 8RZ. **Tel:** 0272 428618.*

Amiga Games

The graphics potential of the Amiga gives games designers an irresistible challenge. We've reviewed some of the latest creations.

By Anne Owen



FLIGHT SIMULATOR II

As the faithful biplane struggled over the first few yards of the muddy airfield, Algy shouted, "chocks away". Moments later the engine seemed to burst into life and the plane lifted away from the French turf, circling as it climbed and there was Biggles waving to the crew below.

Another daring mission behind enemy lines had begun. They were waiting for him, the Baron and his fighter squadrons, the anti-aircraft batteries, his own bombs if they failed to drop at the vital moment over the enemy factories, aerodromes and supply depots.

The mountains ahead formed a massive backdrop to the war-torn scene, the river streaked below indicating that enemy territory was violated. There was no turning back.

If like me, you enjoy a good fantasy flight to death or glory then this is just one scenario you might conjure up for a flight in the Sub Logic II Flight Simulator on your Amiga. The World War One Ace option is one of three possible realistic aircraft simulators to choose from.

The Gates Learjet is the executive jet par excellence, the ultimate status symbol for the American millionaire businessman. You can enter its luxury cabin and sit at the controls for a realistic and rapid flight. Modern means more complicated with more controls, longer flights, the need for navigation aids; basically it means more manual! And there's a keyboard reference card. It would be easier to tell you which keys don't do something.

Good God, these guys have even had to stamp 'not for use in real flight situations' on the route maps they supply with the game, just in case someone gets it into their head that 40 hours on the Sub Logic II Simulator qualifies for the real thing. The sampled sounds coming out of my stereo could raise a few eyebrows in a high building, no problem.

But let's not get above ourselves. The Learjet is for experienced flyers. We must gain our wings in the popular Cessna Turbo Skylane, a variant on the 182, the third option. I think of it as the Fergie option. The old Cessna has been around since the early seventies, not this one in particular you understand. The Sublogic Flight Simulator II is perfectly safe, I think. A crash is in fact a bit of a relief after the previously unrelenting realism.

The scenery appears to be inexhaustible. Perhaps it thins out a bit as you move away from airports, but the disk drive keeps whirring and it keeps on coming in three dimensions. You can look at it from six different viewpoints, and fine-scroll or zoom these viewpoints if you wish.

Also you can look at yourself – sounds crazy? Well you can look at yourself from the control tower, tracking the plane even when well in the distance or you can look at yourself from a tracker plane set in motion at a constant relative distance. It's like someone taking a movie of your flight for a documentary.

What with the undercarrige, the carb heat, oil pressure/heat, the autopilot, the rudder, lights, brakes, ailerons, flaps, airspeed, attitude, altitude, turn co-ordination, heading, vertical speed, magnetic compass, omni-bearing indicators, fuel tanks, tachometer, radios (3), distance measuring equipment, direction finder, transponder, magneto switch and throttle, I find just the one view quite adequate for starters.

Once you can fly, once you can navigate, then the fun begins. The entire simulator environment is adjustable, from the seasons (affecting dawn and dusk) to the weather. Play weatherman, set the cloud base, the wind and turbulence. The reliability factor of the plane can be slid along the scale in either direction and the main elements of realism turned on and off, from the technicality of 'elevator trim' to the rather more fundamental 'crash detect'.

At all times you can bring up a map display of your local chunk of the 'world database'. The manual claims an approximate range of 10,000 by 10,000 miles with a

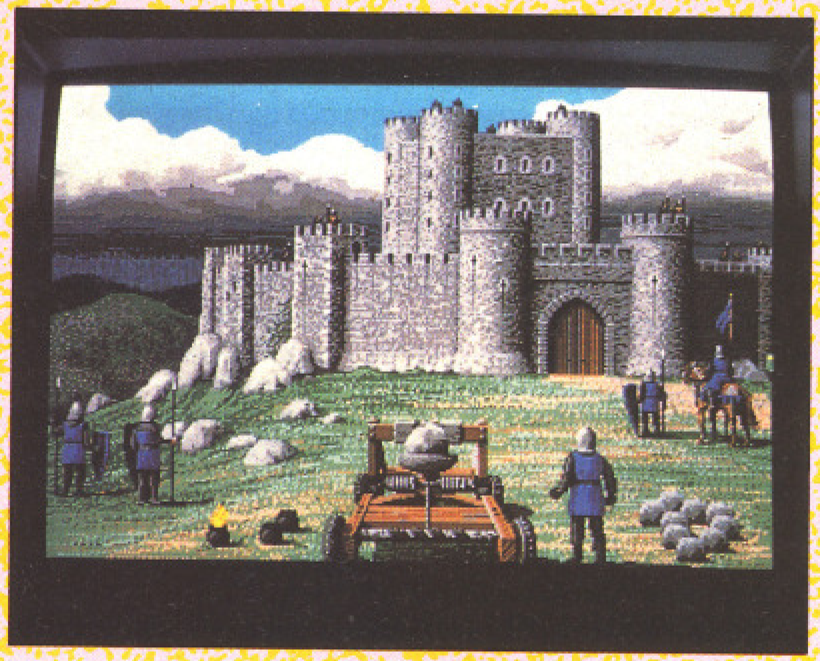
resolution of about one one-hundredth of an inch. Centred on somewhere near Champaign, Illinois (Sublogic's home), it covers the entire continental United States and extends well into Canada, Mexico and the Caribbean.

Airports and other features were digitised directly from aerial photographs or taxi charts – wow. Fortunately, Sublogic don't expect you to spend the rest of your life around this world so they let you either 'SLEW' at high speed to your destination or select 'POSITION SET' and manually set your co-ordinates. The maps help with some example airports and areas.

Well, that's all there is to it. The graphics can appear a bit slow but resizing the main window helps. The sound is superb, the detail enthralling, the scale exhilarating, the documentation all-encompassing. I'll leave you in control now. You are on the ground on runway 27 Right (that's a 270 degree heading, facing west) at Oakland International Airport in Oakland, California. You've got your maps, manual and crib card. You are holding the mouse, correction, yoke. Ease forward on the throttle and away you go. I'm off back to France circa 1917. Come on Biggles old chap, move aside and give me a chance with the Vickers gun, there's a good fellow.

Touchline:

Name: *Flight Simulator II.* ***Price:*** *£42.* ***Machine:*** *Amiga.* ***Supplier:*** *Sublogic.* ***Originality:*** *8/10.* ***Graphics:*** *8/10.* ***Playability:*** *8/10.* ***Value:*** *9/10.*



HOLLIWOOD GAMES

In 'Defender of the Crown' you play the part of a Saxon warlord in Medieval Britain with a castle, some money and a standing army to make your mark. You can hold a tournament, seek a conquest or go raiding. Chivalry also requires your presence at the tournaments of other lords. The second action involves building a campaign army from your home based resources, the third some personal sword play. Robin of Sherwood's help can be enlisted in both.

A map can be studied to get more detailed information about your neighbours. Saxon lords are better disposed than Norman. At the tournament you joust for land, and risk what you dare against opponents of differing skills. Sorties against other warlords involve demolishing castle walls with catapults and utilising Greek Fire (balls of burning pitch). Various tactics are open to you both in overall strategy and on the battlefield. There's an initial opportunity to move decisively to increase your territories and income from taxation.

The defender of the Crown booklet adds to the fun that you can have with this game. As well as hints and tips there is a bit of history, the myth of Robin Hood and the many films made about him.

Defender of the Crown combines strategy and stunning visual sequences to impress and entertain the player. The Cinemaware concept is maintained with well prepared documentation, claims of historical authenticity and a long list of credits for production, music, animations and artwork. The Amiga is finding work for a new brand of artist-technician in the creation of these complex games.

For me the game lacks the edge which would force me back to play regularly and I find the floppy disk access delays irritating. Cinemaware has something in common with good board games and playing Defender of the Crown can be a family affair or an evening in. Others I know however are constantly raiding, jousting and fencing their way into the charms (and arms) of the fair maiden in the castle.

It is interesting briefly to look at the way Defender of the Crown has been created by the team of programmers and artists. The standard graphics format known as IFF means that pictures can be swopped between programmes. Artwork can be drawn in Deluxe Paint 2 or Aegis Images. The animation of a burning fire is achieved by painting in cycling colours of yellow, orange and red.

The next stage of animation such as the catapult's pivot or the maiden fluttering her eyelashes within an essentially still scene can be designed and perhaps even programmed in a package such as Aegis Animator. Even more complex animation such as the sword battles and jousting can be similarly storyboarded. For realism, digitised pictures can be combined with electronic painting as in the introductory identikit pictures of the knights. In similar fashion, stirring music can be written by specialists with programmes such as Deluxe Music and incorporated into the game at the appropriate moments.

That then is Cinemaware. Mindscape produce their programmes across a range of computers but for them too the Amiga offers the best opportunities to realise their games' designs. Electronics Arts too have said that they can do things with the Amiga which they cannot do with any other computer, and that's why they continue to concentrate their efforts on it. So close the curtains, get out the popcorn and beer and settle in for an evening's entertainment.

Touchline:

Name: *Defender of the Crown.* ***Price:*** *£39.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Mirrorsoft (Mindscape).* ***Tel:*** *01-377 4645.* ***Originality:*** *8/10.* ***Playability:*** *7/10.* ***Graphics:*** *9/10.* ***Value:*** *8/10.*

CLASSIC FORMULA

Swooper is the first 'ordinary' game that I have seen on the Amiga. It is a straight up and down the screen shoot'em up. The super smooth and multicoloured sprites dodge and dive down from their military formation. You have mouse or

joystick control of a laser base, and rapid fire and judgement of the sprite movement takes you through the shoot'em up stages. The 'Swoopers' fire back and break off individually, heading for the bottom of the screen to crowd out the weapons base.

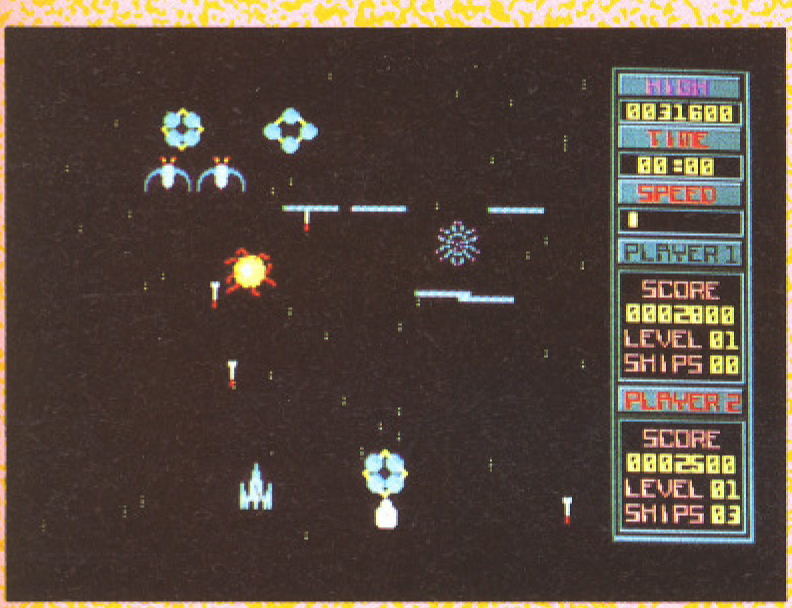
You now weave an anxious bonus journey through asteroids oncoming at various speeds. You have to sidestep like a rugby player, increasing and decreasing your own speed as well as dodging the rocks. The faster you get through, the larger the bonus score. You can also take risks and pick up surreal floating spacemen (who shout for 'help' in word bubbles) for more points.

A catchy jingle plays between games but it only lasts a few seconds and then repeats interminably, turn that dial! The sounds that are amazing in Swooper are the explosions, loud and exciting digitised blasts.

You can judge Swooper as being conventional or classic depending on your taste. It is certainly a fast, noisy and exciting game to play, the version I played would not work with Kickstart 1.2 so use 1.1 or check with Robtek before buying if you don't have 1.1.

Touchline:

Name: *Swooper.* ***Price:*** *£19.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Robtek.* ***Tel:*** *01-847 4457.* ***Originality:*** *5/10.* ***Playability:*** *8/10.* ***Graphics:*** *7/10.* ***Value:*** *8/10.*



GUILD OF THIEVES

The chimney sweep, chambermaid and computer magazine editor are just some of the old traditional professions that are fast disappearing. Now, another can be added to the list. Despite the huge increase in crime figures, when was the last time you saw someone dressed in a flat cap, black mask, stripy tee-shirt and carrying a large bag marked swag. No, the traditional burglar is an endangered species and this is, indirectly, the fault of one Judge Rhino Q. Q. Thrushwacker.

The judge had a novel approach to trying cases that came before him. Anxious to cut through as much red tape as possible, a barrister was likely to be jailed for wittering on about legal nicities. If you were ugly as well, then there was a fair chance that the sentence would be doubled! The fact that he was also partial to the occasional backhander made him a firm favourite with the accused – unless of course they were even uglier or the judge had a bad hangover that day.



The Judge's theory went something like this. There will always be criminals so why not bring some discipline to the profession and form a Guild. It took some time and not a few threats to bring this feat about, but RQQT managed it, setting himself up as the head of the newly formed institution according to the well-founded method of one man, one vote. He was the one man and chose to vote for himself.

The Guild worked well until it was noted that few new members were joining and membership amongst the old guard was dropping off. It was eventually decided that this was due to a somewhat gruesome initiation ceremony and test of courage. The details of this are so gruesome that wild horses would not make me reveal them in a family magazine, although a sackful of used fivers left behind the third basin in the gents on Kings Cross Station might help jog my memory. Suffice to say, this method has now been dropped and a simple practical test substituted.

The Guild of Thieves is the second adventure from the pens of Magnetic Scrolls and looks set to consolidate the success that they had with their first game – The Pawn. Three things set it head and shoulders above other games of this type. The storyline, the parser and the graphics.

The game starts with you in a boat alongside a rickety old jetty. A master thief explains that he has totally cased the joint – in this case an old castle – and knows the value of everything in the place worth nicking. All you have to do is fill your swag bag with the ill-gotten gains.

If you can get into the windmill, the owner is very glad of your company and seems keen to sell you a lute. The problem here is that you don't have any money and anyway, a thief would never buy anything when he could get it dishonestly. There seems to be some sort of do on at the castle, a reunion banquet of the 3rd Kerovnian Defenders, and that proves to be the key to your gaining admission to the castle.

A friendly guard invites you to a rat race in the courtyard. Perhaps that could be a source of money but not wanting to leave anything to chance, you may want to improve the odds by fixing the race a bit.

As you explore the castle, the only obvious treasure seems to be a platinum chalice but that is guarded by a huge bear in a cage. The library is always good for a few clues as you make your way through servants quarters, the billiard room and the various bedrooms including one with a retractable bed.

Outside, the main feature is a temple, complete with safe,

organ, garden and bee-hive and a statue which, on examination does little for your well-being.

The location descriptions are excellent with some marvellous touches of hymour. I particularly enjoyed the description of a painting – a classic by Ripov, painted during his dead period. The puzzles are original and the general storyline more cohereent that in the Pawn.

The parser is quite simply the best there is, surpassing even the mighty Infocom. It is a rare moment indeed when it can't make sense of the gibberish that you have just entered. The nice thing about this is that you start conversing normally with the game rather than using 'adventurespeak', there is a comprehensive editor as well, should you make a typing mistake.

I have gone on record in the past for saying that graphics have no place in adventure games. They should be text only as pictures can never do justice to atmospheric location descriptions. It is eat my hat time. The pictures that accompany the game are superb. There is nothing else to say.

The game comes complete with the latest copy of What Burglar magazine and your indenture forms, the magazine, as well as acting as an anti-piracy device, contains some lovely snippets. Anyone who has played the Pawn will be pleased to know that Honest John has now gone public and is recruiting trainee salesmen. There is also a built in hint sheet should you get stuck. Simply type in enormously long passages of maeaningless characters and let the computer decipher them. You will then get a cryptic clue that may or may not prove helpful.

Is there nothing wrong with this game? Well, the optional speech facility is naff but that apart, I can find no reason at all why you shouldn't start calling the Rainbird offices immediately.

Touchline:

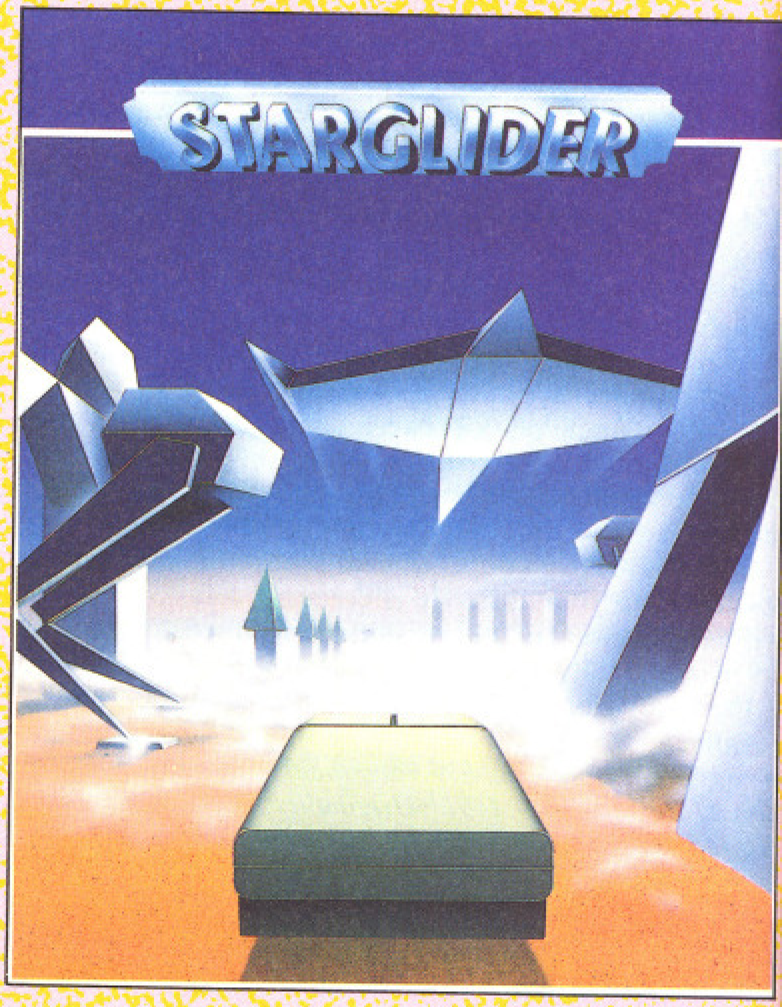
Name: *Guild of Thieves.* ***Supplier:*** *Rainbird.* ***Tel:*** *01-240 8838.* ***Price:*** *£24.95.* ***Originality:*** *8/10.* ***Playability:*** *10/10.* ***Graphics:*** *9/10.* ***Value:*** *9/10.*

THE STARGLIDER EXPERIENCE

The Amiga release of Starglider really puts Rainbird in the forefront of Amiga software publishers. The familiar packaging formula of disk, novella, manual, keyguide and poster effectively work together to create a software 'experience', something a bit more than just a game. The novella is especially tied in with the game and you will only know what it is you are trying to achieve and how you can go about it by reading the story.

In James Follet's entertaining tale we can learn from the bravery of Katra and Jaysan as they try to defeat the Egron fleet which has all but devastated their planet Novenia. The Egron fleet penetrated the Sentinel defence force by modelling their craft on the Stargliders, creatures dear to the Novenians, and whose shape the Sentinels have been programmed to recognise and leave alone.

On the Novenian moon base Katra, woman of action, discovers an airbourne Ground Attack Vehicle, a museum piece protected by an equally antique and amusingly bloody-minded android, AGRO. The male moonbasers are a little cowardly but Katra persuades Jaysan to join her and AGRO



insists on continuing his mission to keep off 'souvenir hunters'.

Starglider, the game, proved just as enjoyable with a colourful screen, very fast 3D vector graphics representing the Egron craft and Novenian structures, an unoriginal but effectively percussive soundtrack (which plays as you rest between games) and sampled sound effects, including shouted warnings from the on-board computer. There is also a breathtaking digitised theme tune which opens the game.

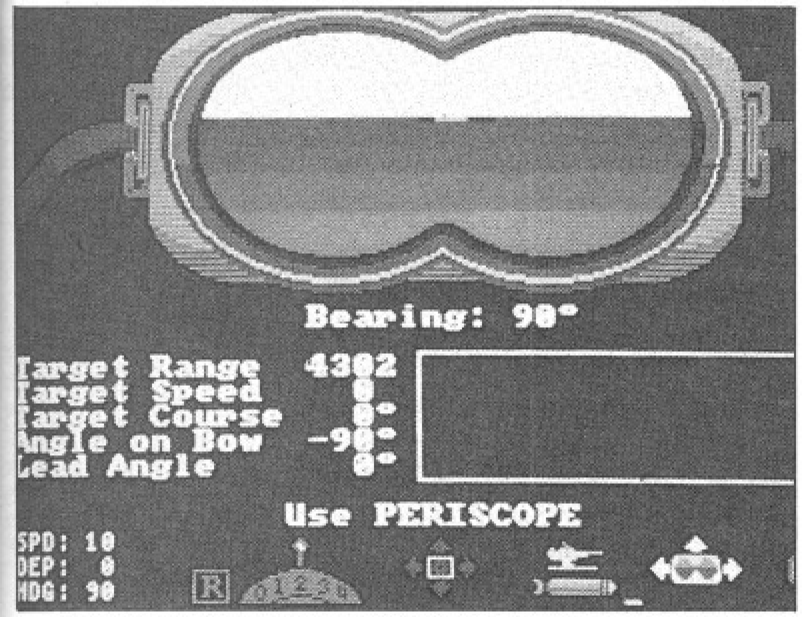
Jeremy San, the programmer, uses the Amiga's abilities well and provides us with an exciting game. You have to outmaneouvre and destroy a variety of Egron vehicles and aircraft with your single AGAV, conserve your energy, dock with revolving repair depots to rearm and use your pilot skills to boost the engergy pod.

Once you have mastered the basic techniques of survival, you can glean information about the Egron fleet, inhibit its strengths, exploit its weaknesses and take the flight to them! It's a convincing scenario and great fun to play. When you encounter Starglider One you can just imagine the arrogant fleet commander Hermann Kruud giving his timid captain a hard time.

To my mind, Starglider joins Marble Madness as an essential part of an Amiga games collection. I would have given a higher 'value' score but for the high price of the software. There's no denying the quality of the package, but Amiga owners are still being asked to pay over the odds. What do you think?

Touchline:

Name: *Starglider.* ***Price:*** *£24.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Rainbird.* ***Tel:*** *01-240 8838.* ***Originality:*** *8/10.* ***Graphics:*** *9/10.* ***Playability:*** *9/10.* ***Value:*** *8/10.*



SILENT SUBMARINER

Are you a patient tactician with an eye for detail but also an opportunist with a ruthless killer streak? Well, there's a job opportunity for a submariner on an American sub-patrolling the Pacific Ocean, circa 1943.

Silent Service took a number of plays before it grabbed me. One particular cat and mouse session with the destroyers of an enemy convoy kept me playing into the night.

The game is based on accurate mapping of the war patrol region, the Pacific between Japan and Australia. a full war patrol is a good evening's entertainment. The manual provides maps with convoy routes, naval bases and facts and figures from history. You can also choose training patrols and convoy action scenarios based on historical situations.

The scale of the simulation is geographically and chronologically accurate. But you don't have to spend 50 days at sea! The passing of time can be increased by up to 32 times 'realtime'.

The time of day is important. You can happily sail on the surface during night at a maximum of 20 knots. When attacked during the day you have to operate below the surface where you won't get above ten knots, and you have limited staying power as the batteries drain.

The game reports actions such as sonar picking up explosions, enemy ships and depth charges seeking out your flimsy hull. When you are in trouble you can blow the emergency tanks to halt an uncontrolled dive or release debris and oil to deceive the ships above.

On board your submarine you move between the map room, the bridge, the periscope, a display of vital guages, damage report and quartermaster's log. This process is irritatingly slow because of the disk access involved. There's no lack of excitement however when it comes to tracking a target with the periscope, firing the deck gun or launching a torpedo on its way. The Torpedo Data Computer (an early analogue device) gives you information on the target and you make your calculations based on bearing, heading and angle on bow. If they are accurate the torpedo will strike home causing flames and oily black smoke to burst forth.

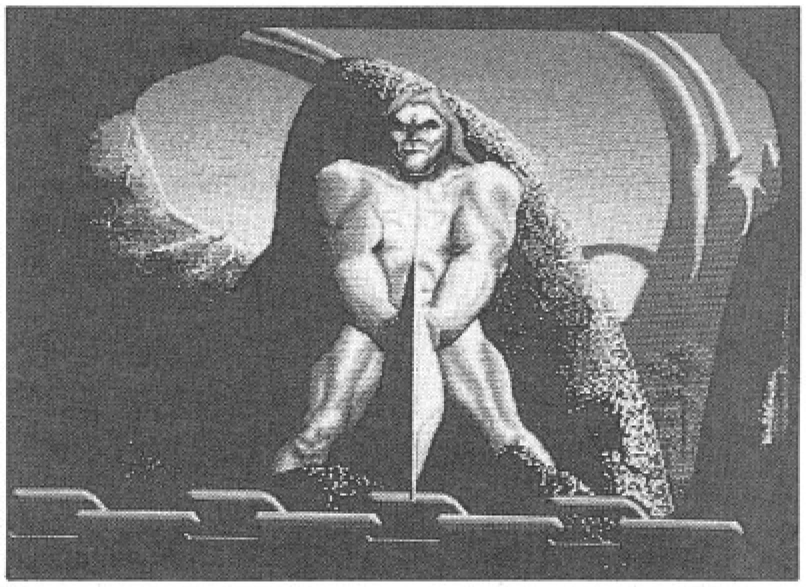
The graphics of the bridge, the conning tower, the submarine damage report and the maps are nicely produced in different styles. There's a nice full screen graphics display of the guages which show the current status of fuel, battery charge, torpedos, shells, time, depth, distance to bottom and so on. The enemy ships are less detailed but this serves to add realistic difficulty to the game.

Sound effects include the low purring, acceleration and deceleration of the engines, the gun fire and torpedo launch. You will jump out of your skin the first time you choose to dive and the claxon goes off.

As well as reasonable use of the Amiga's sound and graphics the parallel keyboard and mouse/joystick controls are very responsive. the manual is superb with maps, drawings, historical background, tactical advice, playing tips and military/seafaring terminology. Silent Service provides accurate detail but it is also capable of instilling some of the anxiety felt by a hunted man, and of the satisfaction of hitting a difficult target after careful preparation and planning.

Touchline:

Name: *Silent Service.* ***Supplier:*** *Microprose.* ***Tel:*** *0666 54326.*___Machine:___ *Amiga.* ***Price:*** *£15.95.* ***Originality:*** *8/10.* ***Playabilty:*** *7/10.* ***Graphics:*** *8/10.* ***Value:*** *8/10.*



BRAIN AND BRAWN REQUIRED

If you prefer swordplay to strategy and wrestling to rest then Barbarian should suit your gameplaying style. It will also introduce you to some of the best character animation yet seen on the Amiga. On seeing the game, the usual reaction is 'I must get an Amiga'. Barbarian lacks nothing in panache, from slickly painted fantasy screens to animated scenes with accompanying digitised cracks of lightening and the rumble of thunder.

The game is an exploration and a mission. You have to destroy the lair of Necron and claim the Kingdom's crown. The finale involves fleeing an exploding volcano against the clock. Hegor moves around his world via a network of ladders, each full screen scrolling into view as he reaches the edge horizontally or vertically. this involves the briefest of pauses. The disk must stay in the drive because as you progress further data is read in.

Control is by a means new to me, combining mouse

button and screen icon. By 'clicking' on an icon you can make Hegor walk, run, jump, stop, move left, right, down and thrust with his sword. One thing you will have to get used to is the repeat effect of clicking the mouse on an icon. This can lead to Hegor dashing in where sensible barbarians employ a degree of caution. If Hegor tries to go beyond the limit of a screen, he hits an invisible wall and jumps back in hilarious fashion, smarting as though stung by a wasp!

The icons also offer the options to defend and to flee. What Barbarian would ever use that one? A second line of icons gives you a score, lives left and allows you to pick up and use objects found during the game. a bow is an essential addition to the armoury but you'll have to take a few risks and pick up some arrows too.

Hegor reacts to commands in different ways depending on the situation. a normal jump becomes a gymnastic somersaulting leap on a collapsing bridge. You have to avoid falling boulders, scale ladders and deal with a mean menagerie of creatures intent on making sure you never achieve 100% in this game. Getting a bow for instance involves fighting the tin man from Yellow Brick Road on one side and a multicoloured leaping lizard/cat on the other.

Various grunts and groans are uttered by the monsters, wraiths, werewolves, rock throwing beasts and armour plated adze swingers. Hegor sighs heroically when 'killed' but is capable of all sorts of contortions depending on the type of demise. Any professional stunt man would be proud of his repetoire. The programmers should certainly be proud of the life they have instilled into his graphical limbs. One early scene has Hegor falling to his doom in slow motion. The scream as he hits the bottom of the ravine is not for the Squemish.

The world of Barbarian is beyond human control, bristling with hostility, a trap around every corner. You have to keep your wits about you and learn by your mistakes. It's a violent world but all in the best possible taste, more Tarzan than Rambo. A save game facility would be appreciated and sometimes Hegor jogs on the spot and lies prone in mid air. But these are minor quibbles in such an enjoyable game.

Put away your Castles of Apshai and Faery Tales, Psygnosis' Barbarian is more exciting, is graphically brilliant and tests a range of skills. To complete this one you barbarians are going to need brains as well brawn.

Touchline:

Name: *Barbarian.* ***Price:*** *£24.95.* ***Machine:*** *Amiga.* ***Supplier:*** *psygnosis.* ***Tel:*** *051-207 0825.* ***Originality:*** *8/10.* ***Graphics:*** *9/10* ***Playability:*** *8/10.* ***Value:*** *9/10.*

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Setting Amiga System Time

Unorganised – read on, discover the advantages of getting the date and time from the workbench using the Intuition gadget interface capabilities.

By Peter Lawrence

I'm the sort of person who continually rewrites and updates his files giving them odd and cryptic names which, although seemed reasonable at the time, a week later always leave me scratching my head wondering which of 'Program newer' and 'Program latest' is really the most recent version.

Fortunately for me, AmigaDOS has a feature which can save much of this frustration. Whenever a file is saved or rewritten to disk, AmigaDOS automatically stores the system time along with the file, and this can be easily accessed using the LIST command from a CLI. In this way I always know which is the most recent version.

Of course, life is never really that easy. I, like most Amiga users do not have a hardware clock in my system and so every time the computer is powered up, the date and time need to be reset manually. This is not too difficult to do from a CLI using the DATE command, but if you are working with the workbench then you have to use the preferences program which is quite large (>50K) and so eats up masses of memory for storage and time for loading. Not good enough I say.

'Well', I hear you say. 'Why not modify your start-up-sequence file to include the date command and prompt for user input. In this way the date can be set every time the system is started.' (See listing 1.)

Accidents can Happen

OK, this is true. I'm glad to hear that you are all tirelessly delving into the magical workings of the CLI despite the considerable effort Commodore seem to have put in to prevent we mere users from even knowing it's there. But, what happens if you make a typing error (and believe me I often doo!) and enter an invalid date or use the wrong format. Yes, date returns some enormous error code, the system gets confused and the command sequence is terminated immediately.

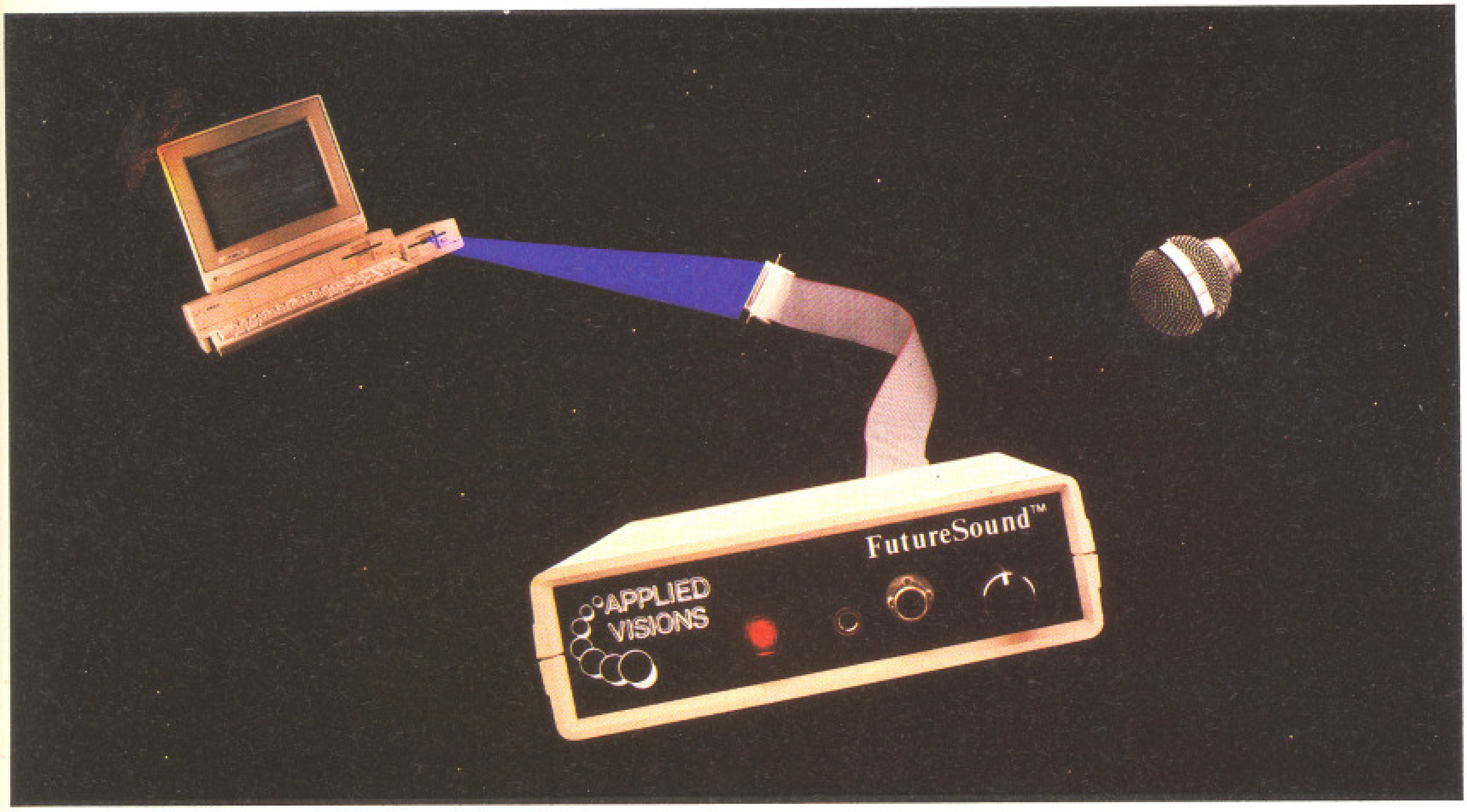
This leaves you to set the date, load the workbench and close down the CLI manually — which quite frankly is too much work to expect. This may sound lazy to you, but what do you expect from someone who won't even take the trouble to give his files logical names.

'So what is the answer?', I hear you cry while desperately waiting for me to get to the point of this article. What all this has been leading up to is a program which allows you to get the date and time from the workbench using the Intuition gadget interface capabilities.

Such a program would be more efficient than loading in preferences with the thousands of bytes it requires to reconfigure the rest of the universe. In fact, why not write the program so that it will also run from a CLI. In that way you could call it from the start-up-sequence and have a more error tolerant way to set the date upon power-up.

The program is presented in listing two and is written in assembly language for the Seka assembler. Assembly language was chosen over C simply because it is faster, more compact and cheaper (which makes it a little more accessible to most Amiga users), and because I don't have a C compiler. In addition, the Seka assembler can be easily used on a system without an external disk drive

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(which I don't have either).

I don't intend now to give a detailed description of how the program functions, the comments included in the listing should be sufficient for any interested person to work out what is going on, provided they are familiar with the basic concepts of structures and library calls used in Amiga assembly language, and the differences between running programmes from the workbench and from a CLI. This is particularly necessary knowledge when using the Seka assembler which does not come supplied with the standard Amiga include files.

If you are not familiar with the particular peculiarities of Amiga assembly language then I suggest you write to the Editor of this September publication and demand that he publish a series of articles to clarify this topic. You could even mention that I am available at modest rates.

Back to the point — basically, this is what the program does. It opens a window (in the upper left-hand corner of the workbench screen) in which the current date and time are displayed. Above and below each of the day, month, year, hour, minutes and seconds, displays are arrow shaped gadgets which, when clicked over using the left mouse button, will increment the day, month, etc.

In this way the date and time can be set to the desired values. This does not, however, change the system time immediately. To do this it is necessary to click the left mouse button over the 'SET' gadget in the lower left of the window. This converts the new date and time into system time.

Next to the 'SET' gadget, there is another gadget marked 'SAVE' which can be used to update the system time on the disk. When the Amiga is booted it looks on the system disk to find when the last file was saved. It reads this time, adds a few seconds and uses it as the system time. The save gadget simply writes an empty file called 'DateStamp' into the root directory of whichever disk is in drive DFO. The idea of this is that if you don't set the time, then every time you boot your system disk the system time will at least be set later than at the last file save. Thus each files date stamp, although not the correct time, will give an indication of the order in which files were created.

However, care should be taken in using this process, particularly if you use more than one boot disk. If, for example, you boot from a disk which you haven't used for a while and then 'LIST' files on another, more recently used disk you will find AmigaDOS will mysteriously display the time of creation as 'future' as if it is trying to predict what you will be working on at some later date.

If you know save a file onto this disk with the 'future' files it will be stamped with the system time and the disk will not preserve the correct order of creation.

Thus, the SAVE function is only included for completeness but it is a better ideal always to set the correct time upon start-up.

Finally, when you've finished with the program just click on the standard close window gadget. The window will disappear and the program will terminate.

Using it yourself

To use this program yourself all you need to do is type it in, assemble it and it will be ready to run from a CLI. If you wish to use it from the workbench then create an appropriate .info. file using the IconEd tool supplied with the workbench disk and you're away. I hope you find it as useful as I do. Good luck, and may time never run backwards for you. YC

Listing 1 - Date Setting Program

```
AbsExecBase             = 4

***  Exec Library Offsets  ***

LVOAlert                = -108
LVOFindTask             = -294
LVOForbid               = -132
LVOGetMsg               = -372
LVOOpenLibrary          = -552
LVOCloseLibrary         = -414
LVOReplyMsg             = -378
LVOWait                 = -318
LVOWaitPort             = -384
LVOOpenDevice           = -444
LVOCloseDevice          = -450
LVODoIO                 = -456

***  DOS Library Offsets  ***

LVOCurrentDir           = -126
LVOOpen                 = -30
LVOInput                = -54
LVOOutput               = -60
LVOWrite                = -48
LVOClose                = -36
LVOLock                 = -84
LVOUnLock               = -90
LVOPrintIText           = -216

***  Intuition Library Offsets  *
**

LVOOpenWindow           = -204
LVOCloseWindow          = -72
LVODisplayBeep          = -96

***  Miscellaneous Constants  ***

UNIT_MICROHZ            = 0
TR_GETSYSTIME           = 10
TR_SETSYSTIME           = 11


GADGIMMEDIATE           = 2
RELVERIFY               = 1
TOGGLESELECT            = $100
GADGHCOMP               = 0
GADGIMAGE               = 4
BOOLGADGET              = 1

GADGETUP                = $40
CLOSEWINDOW             = $200

RP_JAM1                 = 0
RP_JAM2                 = 1


***  Offsets into Standard Struct
ures  ***

LN_SIZE                 = 14
MN_SIZE                 = LN_SIZE+6
wd_RPort                = $32
CLASS                   = MN_SIZE
IADDRESS                = MN_SIZE+8
UserData                = 40
LIBRARY_VERSION         = 31

TC_SIZE                 = $5C
MP_SIZE                 = $22
pr_MsgPort              = TC_SIZE
pr_ConsoleTask          = TC_SIZE+MP
_SIZE+38
pr_CLI                  = pr_Console
Task+8
CLI_CommandName         = 16

sm_ToolWindow           = MN_SIZE+12
sm_ArgList              = sm_ToolWin
dow+4

wa_Lock                 = 0

MODE_OLDFILE            = 1005
MODE_NEWFILE            = 1006

fh_Type                 = 8

io_Command              = 8

wd_UserPort             = $56
MP_SIGBIT               = $0F

AG_OpenLib              = $30000
AO_DOSLib               = $8007


***  Macro to Set Up an Alert  **
*

ALERT:          macro
      ; no., paramArray,scratch
                movem.l d7/a5/a6,-(s
p)
```

```
          move.l  #?1,d7
          ifb ?2
          else
          lea     ?2,a5
          endif
          move.l  4,a6
          jsr     LVOAlert(a6)
          movem.l (sp)+,d7/a5/
a6
          endm

CODE

StartUp:  move.l sp,initialSP
        ; Save stack pointer.
          clr.l  WBenchMsg
        ; No WB message yet.

          move.l AbsExecBase,a
6       ; Find process data.
          suba.l a1,a1
          jsr    LVOFindTask(a
6)
          move.l d0,a4

          tst.l  pr_CLI(a4)
        ; Were we run from WB?
          beq    fromWorkBench
        ; If so, branch.

fromCLI:  bsr    openDOS
        ; Else run from CLI.

        ; Open DOS.
          jsr    Main
        ; Run main programme.

          bra.s  Exit
        ; Clean up and exit.

fromWorkBench:
        ; Run from Workbench
          bsr    OpenDos

          bsr    waitmsg
        ; Wait for WB message

        ; before starting.
          move.l d0,WBenchMsg
        ; Save the message.

          jsr    Main
        ; Perform main routine

          bra.s  exit
        ; Clean up and exit.

exit:     move.l initialSP,sp
        ; Restore stack pointe
r.
          move.l d0,-(sp)
        ; Save return code.
          move.l AbsExecBase,
a6      ; Close DOS.
          move.l DOSBase,a1
          jsr    LVOCloseLibr
ary(a6)
          tst.l  WBenchMsg
        ; Are we WB or CLI tas
k?
          beq.L  ExitToDOS
        ; If CLI then branch.

          jsr    LVOForbid(a6
)       ; Forbid WB from unloa
ding
          move.l WBenchMsg,a1
        ; us before we finish.
          jsr    LVOReplyMsg(
a6)     ; Reply to the message
.
ExitToDOS: move.l (sp)+,d0
        ; Retrieve return code
```

```
          rts
        ; Finished.

noDOS:    ALERT  AG_OpenLib!A
O_DOSLib ; If DOS will not open
          moveq  #100,d0
        ; then alert with 100
          bra.s  exit
        ; as return code.

waitmsg:  lea    pr_MsgPort(a
4),a0   ; Find the message por
t
          jsr    LVOWaitPort(
a6)     ; and wait for message
.
          lea    pr_MsgPort(a
4),a0   ; Now get the message.
          jsr    LVOGetMsg(a6
)
          rts

openDOS:  clr.l  DOSBase
        ; Open the DOS library
.
          lea    DOSName,a1
          move.l #LIBRARY_VER
SION,d0
          jsr    LVOOpenLibra
ry(a6)
          move.l d0,DOSBase
        ; Save library base.
          beq    noDOS
        ; Branch if open faile
d.
          rts

*------------ Main Routine ----
---------*

Main:     clr.l  ReturnCode
        ; Clear return code.
          move.l #IntuitionNam
e,a1    ; Open Intuition.
          move.l #LIBRARY_VERS
ION,d0
          move.l AbsExecBase,a
6
          jsr    LVOOpenLibrar
y(a6)
          move.l d0,IntuitionB
ase     ; Store the base.
          beq    Abort1
        ; If it fails, abort.

          lea    TimerName,a0
        ; Open the timer devic
e.
          lea    IORequest,a1
          move.l #UNIT_MICROHZ
,d0
          clr.l  d1
          jsr    LVOOpenDevice
(a6)
          move.l d0,TimerBase
        ; Store timer base.
          bne    Abort2
        ; If it fails, abort.
          move.l #NewWdw,a0
        ; Get new window struc
t.
          move.l IntuitionBase
,a6
          jsr    LVOOpenWindow
(a6)    ; Open the window.
          move.l d0,Wdw
        ; Save its address.
          beq    Abort3
        ; If it failed then ab
ort.

          move.l AbsExecBase,a
6       ; I/O request to timer
          move.w #TR_GETSYSTIM
E,IOCommand
```

```
          lea    IORequest,a1
        ; to get system time.
          jsr    LVODoIO(a6)

          jsr    ToDate
        ; Convert it to time/d
ate.

          jsr    TimeOut
        ; Display time.
          jsr    DateOut
        ; Display date.

WaitLoop: move.l Wdw,a0
        ; Find window
          move.l Wd_UserPort(a
0),a0   ; and its message port

          move.l a0,MPort
        ; Save its location.
          move.l AbsExecBase,a
6
          jsr    LVOWaitPort(a
6)      ; Wait for a message.

GetMess:  move.l MPort,a0
          move.l AbsExecBase,a
6
          jsr    LVOGetMsg(a6)
        ; Get the message.
GotMess:  cmpi.l #0,d0
        ; If it was null then
          beq.s  WaitLoop
        ; wait for another.
          move.l d0,a1
          move.l a1,Message
        ; Save the message.
          move.l Class(a1),d1
        ; Find its type.
          cmpi.l #GADGETUP,d1
        ; Custom gadget?
          beq.L  GadgPckd
        ; Yes - then branch.

CleanUp4: move.l Wdw,a0
        ; Else assume window c
lose.
          move.l IntuitionBase
,a6
          jsr    LVOCloseWindo
w(a6)   ; So, close window.

CleanUp3: move.l AbsExecBase,a
6
          lea    IORequest,a1
          jsr    LVOCloseDevic
e(a6)   ; and timer device.

CleanUp2: move.l IntuitionBase
,a1
          move.l AbsExecBase,a
6
          jsr    LVOCloseLibra
ry(a6)  ; and Intuition

CleanUp1: move.l ReturnCode,d0
        ; Retrieve return code
.
          rts
Abort1:   move.l #41,ReturnCod
e       ; Timer wouldn't open.
          bra.s  CleanUp1

Abort2:   move.l #42,ReturnCod
e       ; Intuition wouldn't o
pen.
          bra.s  CleanUp2

Abort3:   move.l #43,ReturnCod
e       ; Window wouldn't open
.
          bra.s  CleanUp3

Abort4:   move.l #44,ReturnCod
e       ; Set time failed.
          bra.s  CleanUp4
```

```
ToDate:         move.l Seconds,d0
              ; Divide system time b
y
                lsr.l  #7,d0
              ; 86400 to get no. of
                divu   #675,d0
              ; elapsed days.
                move.w d0,ElapsedDay
s
                mulu   #675,d0
                lsl.l  #7,d0
              ; Find the no. of
                move.l Seconds,d1
              ; seconds which have
                sub.l  d0,d1
              ; elapsed today.
                divu   #3600,d1
              ; How many hours is th
is?
                move.b d1,Hours
                swap   d1
                ext.l  d1
                divu   #60,d1
              ; Plus how many mins.
                move.b d1,Mins
                swap   d1
                move.b d1,Secs
              ; and remaining secs.
                move.w ElapsedDays,d
0             ; No. of days
                ext.l  d0
                addq.l #1,d0
              ; including today.
                divu   #1461,d0
              ; How many 4 year cycl
es?
                move.w d0,d1
                move.b #29,MonthMax+
2             ; Assume Feb. has 28 d
ays.
                lsl.w  #2,d1
              ; multiply by 4 gives
yrs.
                add.w  #78,d1
              ; Take relative to 197
8.
                move.b d1,Year
                swap   d0
                lea    DayTable,a0
              ; How many days into c
ycle?
                move.l #2,d1
MonthSrch:      cmp.w  (a0,d1.w),d0
              ; Index into table to
find
                ble.s  MonthFnd
              ; what the month is.
                addq.w #2,d1
                bra.s  MonthSrch
MonthFnd:       sub.w  -2(a0,d1.w),d
0             ; Subtract no. of days
 to
                move.b d0,Day
              ; end of last month->d
ate.
                lsr.w  #1,d1
                ext.l  d1
              ; Months into cycle
                subq.l #1,d1
              ; up to last month.
                divu   #12,d1
              ; Calculate years.
                cmpi.b #2,d1
              ; If it's 2 then leap
year.
                bne.s  NotLeap
                addq.b #1,MonthMax+2
              ; thus Feb. has 29 day
s.
NotLeap:        add.b  d1,Year
              ; Gives correct year
                swap   d1
                addq.l #1,d1
                move.b d1,Month
              ; and month.
                rts
```

```
GadgPckd:       move.l IAddress(a1),
a1            ; Address of gadget st
ruc.
                move.l UserData(a1),
a1            ; Address of routine.
                jsr    (a1)
              ; Perform function.
                move.l AbsExecBase,a
6             ; Reply to the message
.
                move.l Message,a1
                jsr    LVOReplyMsg(a
6)
                bra.L  GetMess

GadgRout1:
                lea    hours,a1
              ; Increment hours.
                addi.b #1,(a1)
                cmpi.b #24,(a1)
              ; If hours>23 then
                bne.s  GRExit1
                clr.b  (a1)
              ; hours=0.
GRExit1:        jsr    TimeOut
              ; Update display
                rts

GadgRout4:
                lea    hours,a1
              ; Decrement hours.
                subi.b #1,(a1)
                cmpi.b #-1,(a1)
                bne.s  GRExit4
                move.b #23,(a1)
GRExit4:        jsr    TimeOut
                rts

GadgRout2:
                lea    mins,a1
              ; Increment minutes.
                addi.b #1,(a1)
                cmpi.b #60,(a1)
                bne.s  GRExit2
                clr.b  (a1)
GRExit2:        jsr    TimeOut
                rts

GadgRout5:
                lea    mins,a1
              ; Decrement minutes.
                subi.b #1,(a1)
                cmpi.b #-1,(a1)
                bne.s  GRExit5
                move.b #59,(a1)
GRExit5:        jsr    TimeOut
                rts

GadgRout3:
                lea    secs,a1
              ; Increment seconds.
                addi.b #1,(a1)
                cmpi.b #60,(a1)
                bne.s  GRExit3
                clr.b  (a1)
GRExit3:        jsr    TimeOut
                rts

GadgRout6:
                lea    secs,a1
              ; Decrement seconds.
                subi.b #1,(a1)
                cmpi.b #-1,(a1)
                bne.s  GRExit6
                move.b #59,(a1)
GRExit6:        jsr    TimeOut
                rts

GadgRout7:
                lea    day,a1
              ; Increment day.
                addi.b #1,(a1)
                move.b Month,d0
              ; Get current month
                ext.w  d0
                lea    MonthMax,a0
```

```
                move.b (a0,d0.w),d0
                cmp.b  (a1),d0
              ; and check date is va
lid.
                bne.s  GRExit7
                move.b #1,(a1)
              ; Else it's the 1st.
GRExit7:        jsr    DateOut
                rts

GadgRout10:
                lea    day,a1
              ; Decrement day.
                subi.b #1,(a1)
                move.b Month,d0
              ; Get month and find
                ext.w  d0
                lea    MonthMax,a0
                move.b (a0,d0.w),d0
                subi.b #1,d0
              ; maximum date in mont
h.
                tst.b  (a1)
              ; If current date is z
ero
                bne.s  GRExit10
                move.b d0,(a1)
              ; then use max. date.
GRExit10:       jsr    DateOut
                rts

GadgRout8:
                lea    month,a1
              ; Increment month.
                addi.b #1,(a1)
                cmpi.b #13,(a1)
                bne.s  GRExit8
                move.b #1,(a1)
GRExit8:        jsr    DateOut
                rts

GadgRout9:
                lea    year,a1
              ; Increment year.
                addi.b #1,(a1)
                cmpi.b #100,(a1)
                bne.s  GRExit9
                clr.b  (a1)
GRExit9:        move.b (a1),d0
                ext.w  d0
                ext.l  d0
                divs   #4,d0
                swap   d0
              ; No. of years into cy
cle.
                tst.w  d0
                beq    LeapYear9
              ; If not a leap year t
hen
                move.b #29,MonthMax+
2             ; Feb. has 28 days
                bra.s  WayOut9
LeapYear9:      move.b #30,MonthMax+
2             ; else Feb. has 29 day
s.
WayOut9:        jsr    DateOut
                rts

GadgRout11:
                lea    month,a1
              ; Decrement month.
                subi.b #1,(a1)
                cmpi.b #0,(a1)
                bne.s  GRExit11
                move.b #12,(a1)
GRExit11:       jsr    DateOut
                rts

GadgRout12:
                lea    year,a1
              ; Decrement year.
                subi.b #1,(a1)
                cmpi.b #-1,(a1)
                bne.s  GRExit12
                move.b #99,(a1)
GRExit12:       move.b (a1),d0
                ext.w  d0
```

```
              ext.l   d0
              divs    #4,d0
              swap    d0
              tst.w   d0
              beq     LeapYear12
              move.b  #29,MonthMax+
2
              bra.s   WayOut12
LeapYear12:   move.b  #30,MonthMax+
2
WayOut12:     jsr     DateOut
              rts

GadgRout13:   move.b year,d0
          ; Set the system time.
              ext.w  d0
              subi.w #78,d0
          ; Year relative to 197
8.
              bpl.s  C20
          ; If year<78 then 21 c
ent.
              addi.b #100,d0
          ; so add 100.
C20:          ext.l  d0
              divu   #4,d0
          ; No. of cycles.
              move.w d0,d1
              swap   d0
              mulu   #1461,d1
          ; No. of days elapsed
              move.w d1,ElapsedDay
s         ; before the cycle.
              mulu   #12,d0
              add.b  Month,d0
          ; No. months into cycl
e.
              subq.w #1,d0
          ; as of last month.
              lea    DayTable,a0
          ; How many days is thi
s?
              lsl.w  #1,d0
              move.w (a0,d0.w),d1
              move.b day,d0
              ext.w  d0
              add.w  d0,d1
          ; Add date
              subq.w #1,d1
          ; excluding today.
              add.w  ElapsedDays,d
1
              ext.l  d1
              mulu   #675,d1
              lsl.l  #7,d1
              move.l d1,Seconds
          ; Convert this to secs
.
              move.b Hours,d1
              ext.w  d1
              mulu   #3600,d1
          ; Add hours x3600.
              add.l  d1,Seconds
              move.b Mins,d1
              ext.w  d1
              mulu   #60,d1
          ; Add minutes x60.
              move.b Secs,d0
              ext.w  d0
              ext.l  d0
              add.l  d0,d1
              add.l  d1,Seconds
          ; Add seconds.

              lea    IORequest,a1
          ; IO request to timer.
              move.l AbsExecBase,a
6
              move.w #TR_SETSYSTIM
E,IOCommand
              jsr    LVODoIO(a6)
          ; Set system time.
              bne    abort4
              rts

GadgRout14:   move.l DOSBase,a6
          ; Write date to disk.
```

```
              move.l #FileName,d1
          ; Load file name.
              move.l #MODE_NEWFILE
,d2
              jsr    LVOOpen(a6)
          ; Open the file.
              move.l d0,Handle
          ; Save the handle.
              move.l d0,d1
              move.l #Buffer,d2
              clr.l  d3
              jsr    LVOWrite(a6)
          ; Write an empty file
              move.l Handle,d1
              jsr    LVOClose(a6)
          ; then close it.
              rts

TimeOut:      lea    TxtOut,a0
          ; Find text output buf
fer.
              move.b hours,d0
          ; Put hours into the b
uffer
              moveq  #1,d1
          ; without leading zero
s.
              jsr    TextForm
              move.b #':',(a0)+
          ; Add a ':'
              move.b mins,d0
          ; Output mins. to buff
er
              clr.b  d1
          ; with leading zeros.
              jsr    TextForm
              move.b #':',(a0)+
          ; Add another ':'
              move.b secs,d0
          ; Output secs.
              clr.b  d1
          ; with leading zeros.
              jsr TextForm
              move.b #0,(a0)
          ; Null to terminate.
              move.l Wdw,a0
          ; Find the window.
              move.l wd_RPort(a0),
a0        ; Find its raster port
.
              lea    OutPutTime,a1
          ; IntuiText structure.
              clr.l  d0
              clr.l  d1
              move.l IntuitionBase
,a6
              jsr    LVOPrintIText
(a6)      ; Output time as Intui
Text.
              rts

DateOut:      lea    TxtOut,a0
              move.b day,d0
          ; Day into output buff
er
              moveq  #1,d1
          ; without leading zero
s.
              jsr TextForm
              move.b #'/',(a0)+
          ; Then a '/'.
              move.b month,d0
          ; Get month and
              ext.w  d0
              ext.l  d0
              subq.b #1,d0
              asl.b  #2,d0
              lea    MonthBase,a1
          ; index it into a tabl
e
              move.l (a1,d0.w),(a0
)+        ; of month names.
              move.b year,d0
              clr.b  d1
              jsr TextForm
          ; Add month to output.
              move.b #0,(a0)
```

```
          ; Null to terminate.
              move.l Wdw,a0
              move.l wd_RPort(a0),
a0
              lea    OutPutDate,a1
              clr.l  d0
              clr.l  d1
              move.l IntuitionBase
,a6
              jsr    LVOPrintIText
(a6)      ; Output IntuiText.
              rts

Textform:     ext.w  d0
          ; Add two digits to st
ring.
              ext.l  d0
          ;Input word in d0
              divu   #10,d0
          ;String Ptr in a0
              tst.b  d0
          ;1 in d1-> no leading
zeros
              beq    Space
          ; Branch if value zero
?
              move.b d0,(a0)
          ; Output first digit.
              addi.b #'0',(a0)+
          ; Convert to ASCI.
SndDigit:     swap   d0
              move.b d0,(a0)
          ; Output 2nd digit.
              addi.b #'0',(a0)+
          ; Convert to ASCI.
              rts

Space:        tst.b  d1
          ; Leading zeros requir
ed?
              beq    Zero
              move.b #' ',(a0)+
          ; If no then print spa
ce
              bra    SndDigit
          ; then 2nd digit.
Zero:         move.b #'0',(a0)+
          ; Otherwise print zero
              bra    SndDigit
          ; then second digit.

**********************************
**********************************
*****

***  Data  ***

IntuitionName: dc.b 'intuition.li
brary',0
DosName:       dc.b 'dos.library'
,0
FileName:      dc.b 'DF0:DateStam
p',0
TimerName:     dc.b  'timer.devic
e',0

Buffer:

Align 4

Image1:        dc.w 0,0,16,8,1
          ; Small up arrow gadge
t.
               dc.l ImageData1
               dc.b 2,0
               dc.l 0
ImageData1:    dc.w $180,$3C0,$7E
0,$FF0
               dc.w $1FF8,$3FFC,$
7FFE,$FFFF

Image2:        dc.w 0,0,16,8,1
          ; Small down arrow gad
get.
               dc.l ImageData2
               dc.b 2,0
```

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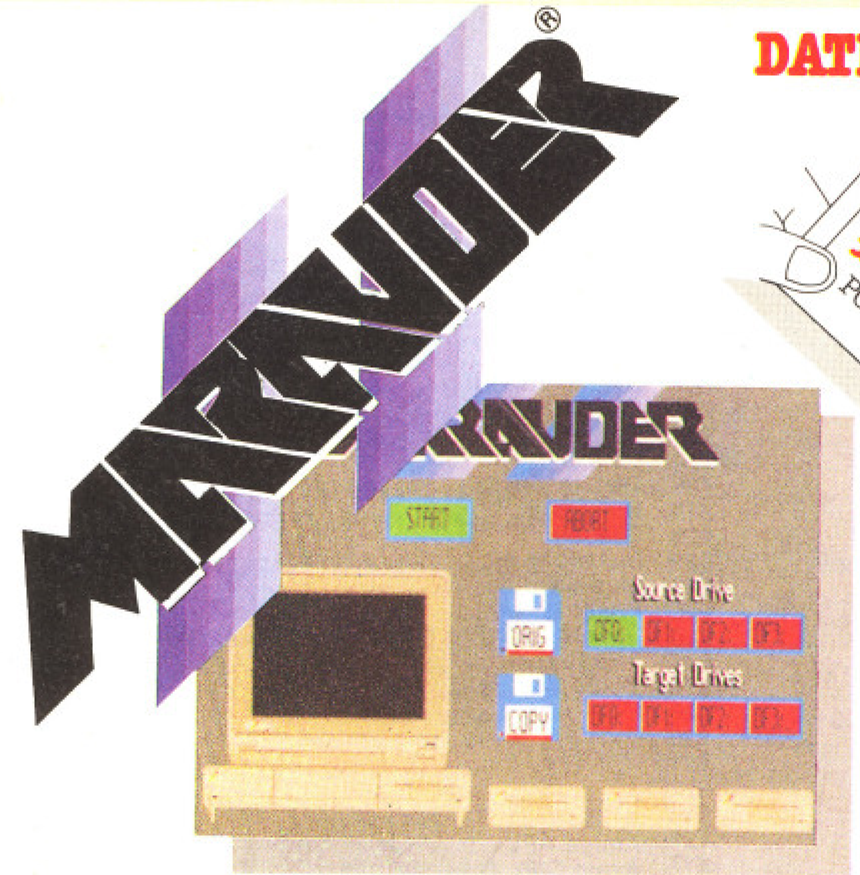
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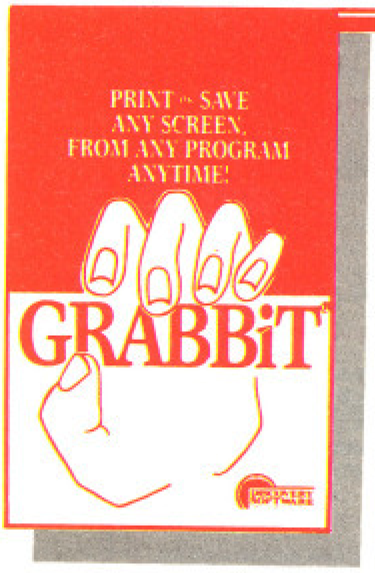
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```
                dc.l 0
ImageData2:     dc.w $FFFF,$7FFE,$
3FFC,$1FF8
                dc.w $FF0,$7E0,$3C
0,$180

Image3:         dc.w 0,0,32,8,1
            ; Large up arrow gadge
t.
                dc.l ImageData3
                dc.b 2,0
                dc.l 0
ImageData3:     dc.w $18,0,$7E,0,$
FF,0,$3FF,$C000
                dc.w $7FF,$E000,$1
FFF,$F800
                dc.w $3FFF,$FC00,$
FFFF,$FF00

Image4:         dc.w 0,0,32,8,1
            ; Large down arrow gad
get.
                dc.l ImageData4
                dc.b 2,0
                dc.l 0
ImageData4:     dc.w $FFFF,$FF00,$
3FFF,$FC00
                dc.w $1FFF,$F800,$
7FF,$E000,$3FF,$C000
                dc.w $FF,0,$7E,0,$
18,0

Image5:         dc.w 0,0,54,12,1
            ; Box gadget (SET & SA
VE)
                dc.l ImageData5
                dc.b 2,0
                dc.l 0
ImageData5:     dc.w $FFFF,$FFFF,$
FFFF,$FC00
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $8000,$0000,$
0000,$0400
                dc.w $FFFF,$FFFF,$
FFFF,$FC00

GadgStruc:      macro ; Gadget No.
, Next Gadget, Left, Top, Image N
o.

GadgetNo?1:     dc.l GadgetNo?2
                dc.w ?3,?4
                if [?5=1]![?5=2]
                  dc.w 16,8
                else
                  dc.w 24,8
                endif
                dc.w GADGHCOMP!GAD
GIMAGE
                dc.w RELVERIFY
                dc.w BOOLGADGET
                dc.l Image?5,0,0,0
,0
                dc.w ?1
                dc.l GadgRout?1
            endm

***  Arrow Gadget Structures  ***

                GadgStruc 1,2,75,15,1
                GadgStruc 2,3,99,15,1
                GadgStruc 3,4,123,15,1
                GadgStruc 4,5,75,31,2
                GadgStruc 5,6,99,31,2
                GadgStruc 6,7,123,31,2
                GadgStruc 7,8,71,53,1
                GadgStruc 8,9,95,53,3
                GadgStruc 9,10,127,53,1
                GadgStruc 10,11,71,69,2
                GadgStruc 11,12,95,69,4
                GadgStruc 12,13,127,69,2

GadgetNo13:     dc.l GadgetNo14
            ; SET gadget structure
.
                dc.w 42,84
                dc.w 54,12
                dc.w GADGHCOMP!GAD
GIMAGE
                dc.w RELVERIFY
                dc.w BOOLGADGET
                dc.l Image5,0,Text
13,0,0
                dc.w 13
                dc.l GadgRout13

GadgetNo14:     dc.l 0
            ; SAVE gadget structur
e.
                dc.w 117,84
                dc.w 54,12
                dc.w GADGHCOMP!GAD
GIMAGE
                dc.w RELVERIFY
                dc.w BOOLGADGET
                dc.l Image5,0,Text
14,0,0
                dc.w 14
                dc.l GadgRout14

NewWdw:         dc.w 0,0,211,110
            ; New Window Structure

                dc.b -1,-1
                dc.l CLOSEWINDOW!G
ADGETUP
                dc.l $2100E
                dc.l GadgetNo1,0,D
STitle,0,0
                dc.w 0,0,0,0
                dc.w 1

DSTitle:        dc.b 'Set System T
ime',0      ; Window Title.

Text13:         dc.b 1,0,RP_JAM1,0
            ; IntuiText "SET"
                dc.w 15,3
                dc.l 0,String13,0

Text14:         dc.b 1,0,RP_JAM1,0
            ; IntuiText "SAVE"
                dc.w 10,3
                dc.l 0,String14,0

String13:       dc.b 'SET',0
String14:       dc.b 'SAVE',0

align 4

* IO Request Structure *

IORequest:      dc.l   0,0
                dc.b   5,0
                dc.l   0,0
                dc.w   40
                dc.l   0
                dc.l   0
IOCommand:      dc.w   0
                dc.b   0,0

Seconds:        dc.l   0
Micros:         dc.l   0

* IntuiText Structure for date/ti
me output

align 4

OutPutTime:     dc.b 0,1,RP_JAM2,0
                dc.w 75,23
                dc.l 0,TxtOut
                dc.l 0

align 4

OutPutDate:     dc.b 0,1,RP_JAM2,0
                dc.w 71,61
                dc.l 0,TxtOut
                dc.l 0

align 4
Pad:            dc.b 0

TxtOut:         dc.b '
            ; Ten blank spaces

align 4

MonthBase:      dc.b 'Jan/'
                dc.b 'Feb/'
                dc.b 'Mar/'
                dc.b 'Apr/'
                dc.b 'May/'
                dc.b 'Jun/'
                dc.b 'Jul/'
                dc.b 'Aug/'
                dc.b 'Sep/'
                dc.b 'Oct/'
                dc.b 'Nov/'
                dc.b 'Dec/'

MonthMax:       dc.b 0,32,29,32,31
,32,31,32,32,31,32,31,32

align 2

DayTable:       dc.w 0,31,59,90,12
0,151,181,212,243,273,304,334,365
                dc.w 396,425,455,4
85,516,546,577,608,638,669,699,73
0
                dc.w 761,790,821,8
51,882,912,943,974,1004,1035,1065
                dc.w 1096,1127,115
5,1186,1216
                dc.w,1247,1277,130
8,1339,1369,1400
                dc.w 1430,1461


DATA

align 4
ReturnCode:     blk.l 1
Handle:         blk.l 1
IntuitionBase:  blk.l 1
TimerBase:      blk.l 1
Wdw:            blk.l 1
Message:        blk.l 1
MPort:          blk.l 1
DOSBase:        blk.l 1
initialSP:      blk.l 1
WBenchMsg:      blk.l 1

hours:          blk.b 1,13
mins:           blk.b 1,13
secs:           blk.b 1,13

day:            blk.b 1,13
month           blk.b 1,11
year:           blk.b 1,79

align 2
.fo=//ENDS

ElapsedDays:    blk.w 1

END
```

Graphics Butcher

We look at the latest package in special effects for the Amiga.

By Anne Owen

The Amiga is the graphics microcomputer par excellence with a number of powerful and highly rated paintbox, technical drawing and animation programmes. The latest 'effects' program from Eagle Software is now available in the UK from Arithmos Software. Rather inappropriately, but shockingly titled 'Butcher', the program comes complete with axe screen icon which chops down when double clicked!

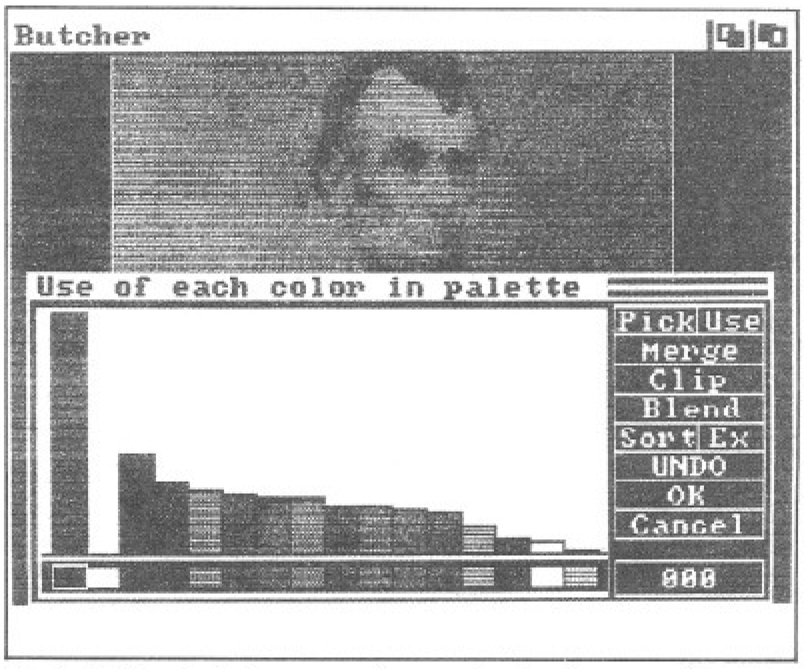
Butcher provides a number of special effects for an ILBM (IFF Interleaved Bitmap) format file. Thus pictures from Deluxe or Aegis packages can be imported for attention. The simplest feature to use and one of the most useful is that of printing a selected part of the screen, including Hold and Modify screens. In this way any rectangular shaped window can be dumped to a printer supported by Preferences, black and white, colour or laser, either in a standard or enlarged format.

Butcher will load different screen modes and convert between HAM and low resolution with and without interlace. This will be particularly handy for Deluxe Paint users. Dpaint 2 users can change screen format. Butcher will not load the 320 by 340 full page or 352 by 240 full video formats. Butcher provides basic line, rectangle and freehand drawing for retouching purposes. The picture can be reversed or flipped a very fast operation.

Any picture on screen has a default palette. Butcher can adjust the palette and you can maintain three different versions in memory. You can also save them. You can work on individual colours picked from the screen pixels or modify factors such as RGB mix and hue saturation value over the whole range. Colours can be sorted by intensity, copied and 'spread' between two specified colours. Butcher will also 'map' one palette onto another for a closer match.

The most stunning effects available are edging, pixelating (called mosaic) and filtering. During the edging process Butcher decides whether any particular pixel is part of an edge by examining its neighbouring pixels. You can control the threshold at which Butcher will judge the pixel at sufficient variance with its neighbours to be plotted as the edge. The resulting effect sharpens the picture.

Pixelation is the conversion of the picture into rectangular 'titles', a favourite effect in the printing industry. A variety of tile sizes are available, but I felt the smallest possible was not quite small enough. Filtering again looks at



the individual pixels, removing any isolated groups from the picture. The size of group and the area of picture processed are both under user control.

Butcher offers an insight into the way an Amiga screen is built up, offering the ability to change the number of bit planes displayed. Each screen pixel has its own corresponding bit of data. A 320 by 200 display has 64,000 individual pixels per plane (8,000 bytes of memory). A histogram of the different coloured pixels can be displayed and colours from any clipped (selected) part of the screen merged, exchanged or sorted. These sometimes drastic changes to a picture can usually be restored because Butcher retains a backup bitmap.

Despite the lacklustre packaging, Butcher proved exciting software for anyone manipulating graphics on their Amiga. The processes are basically those used in much more powerful systems in the printing and video industries and are therefore educational as well. Anyone contemplating desk top publishing or presentation graphics will find Butcher can liven up their screens.

Touchline:

***Name:** Butcher. **Supplier:** Arithmos. **Tel:** Amiga Centre, Scotland 031 5574242. **Machine:** Amiga. **Price:** £25.*

Animated Graphics

No hardware Sprites on your Plus/4? Never mind, movement in hi-res mode is still possible, as this program shows.

By Barry Dunmall

The Plus/4 has high quality graphics with drawing and painting commands available in Basic. Unfortunately it does not have hardware sprites and so it is difficult to produce convincing animation.

The following program, written mainly in Basic uses the technique of cartooning to produce movement in hi-res graphics. Six different pictures are repeatedly displayed on the screen giving the effect of repeated motion.

Operating in text mode the Plus /4 (or C16 with a 64K RAM pack) has 60671 bytes free to Basic. This is situated in the 64K of RAM from 4K to 64767. The RAM below 4K is used by the text screen, the operating system and Basic itself. Above 64767 are the graphics/sound chip registers and other I/0 devices.

When a graphics mode is selected, the RAM from 6K to 16K is reserved for the 2K colour map and 8K bit-map. The start of Basic is moved up to 16K. This leaves 2K of RAM unused from 4K to 6K.

If the top of Basic is set to 6K before selecting the graphics mode, the start of Basic remains at 4K and extends to 6K. So the 2K of RAM is regained for the Basic program.

This leaves enough RAM free above 16K for five additional 8K graphic bit-map screens which the graphics chip can be directed to look at in addition to the normal bit-map. Each bit-map screen shares the original colour map from 6K to 8K.

Program Description

The program starts (line 105) by setting the pointers to the top of Basic to 6143; this will ensure that Basic is located between 4K and 6K when the hi-res bit map mode is selected with a GRAPHIC 1 command later in the program.

In line 115 the variable GC is set to 65298; this is the address of the graphics chip register. The contents of this register must be changed when it is required to look at a bit map located somewhere other than the normal 8K to 16K.

Lines 130 to 140 are a routine which POKEs a machine code subroutine into memory at locations 818 to 860 (the start of the tape buffer). The routine, when called with a SYS 818 command, will copy an 8K block of a RAM from 8K to 16K, the normal bit-map location, to a start address POKEd into location 827. The data for the code is in lines 145 to 170.

Lines 185 to 210 are where the bit map pictures are drawn and copied into the appropriate locations. The variable SC is set initially to 5 in the FOR-NEXT loop; this means that screen 5 will be drawn and copied first followed by screen 4 down to screen 0. Screen 0 does not in fact need to be copied but is copied to itself as a convenience.

Line 195 calls the subroutine which draws the picture for the appropriate screen number (SC); this routine starts at line 705. You will notice that all drawing commands are referenced to the screen number; this is a convenient way of controlling what is being drawn and also means that you will be able to produce a complicated picture within the 2K of Basic RAM available by calling the same subroutine six times with only SC being changed.

After each picture is drawn the copy subroutine is called (line 205); this is situated at line 345. First the destination address is poked into 827, the required value being completed from the screen number; the machine code subroutine is then called with SYS 818 in line 355.

When all the bit maps have been drawn and copied, a subroutine to set the colour map is called in line 225; this routine is situated at line 505.

You will recall from earlier that all the bit maps share the same colour map located between 6K and 8K. This is necessary because there is not enough continuous RAM left in the machine to provide a separate 2K colour map for each screen.

The implication of a shared colour map is that colour map cells, corresponding to each 8x8 bit-cell of the bit map must be appropriatley set for all the screens. The colour map is similar to the text screen as it has a resolution of 40x25, and different foreground and background colours or brightnesses can theoretically be set for each of the 1000 locations. The process of setting the colour map is more difficult to describe than perform, and if you watch the colour map being set after the bit maps have been drawn you will understand the principle.

Refering to the subroutine for setting the colours in line 505, the FOR-NEXT loop (LP) should be set to the number of different colour blocks that you wish to set, in this case five. Each time the loop is executed, data from line 540 onwards is read into the eight variables SX,FX,SY,FY,CO,B0,C1,B1. These correspond to the following:

SX:Start of colour block across screen.
FX:Finish of colour block across screen.
(These must be in the range 0 to 39 with FX > SX.)
SY:Start of colour block down screen.
FY:Finish of colour block down screen.

(These must be in the range 0 to 24 with FY > SY.)
CO:Background colour for the block. (Range 1 to 16.)
BO:Brightness to C0 for the block. (Range 0 to 7.)
C1:Forground colour for the block. (Range 1 to 16.)
B1:Brightness of C1 for the block. (Range 0 to 7.)

Finally once all the screens have been drawn and coloured, the rotate screens routine is entered in line 240. This is a continuous loop which runs until the stop key is pressed. Each of the six lines between the DO and LOOP statements switches in a different but map screen by POKEing the appropriate value into the graphic chip register address contained in variable GC.

The GOSUB at the end of each line is to a delay subroutine located at line 300. This routine uses the internal timer TI to create a delay and so vary the rate at which the screens are switched. This subroutine itself calls another subroutine located at line 325. This routine looks to see if a key has been pressed, and if it detects a numeric key between 0 and 9 then it alters the value of the variable T used in the delay routine thus increasing or decreasing the length of the delay. Try pressing the keys 0 to 9 when the program is running to see the effect.

Changing the Program

The subroutines DRAW PICTURE and POKE SCREEN COLOURS at lines 705 and 505 can be changed in order to create your own moving pictures. The rest of the program should not be altered unless you find an improvement. If you want more memory for drawing and colouring your pictures then all of the lines containing REM statements throughout the program can be deleted.

As a final comment you are advised to save a modified program to tape or disk before running. This is because if an OUT OF MEMORY? error occurs then you may loose the Basic program.

PROGRAM: ANIMATOR +4

```
100 REM SET TOP OF BASIC TO 6143
105 POKE 55,255:POKE 56,23:CLR
110 COLOR4,7,2:COLOR0,9,6:COLOR1,6,3
115 GC=65298:T=6
120 :
125 REM POKE MC SCREEN COPY ROUTINE
130 FOR I=818TO860
135 READV:POKEI,V
140 NEXTI
145 DATA120,141,63,255,169,0,133,251
150 DATA169,64,133,252,169,0,133,253
155 DATA169,32,133,254,160,0,162,32
160 DATA177,253,145,251,200,208,249,230
165 DATA252,230,254,202,208,242,141,62
170 DATA255,88,96
175 :
180 REM DRAW & COPY 6 PICTURES
185 FORSC=5TO0STEP-1
190 REM DRAW PICTURE
195 GOSUB705
200 REM COPY PICTURE
205 GOSUB345
210 NEXTSC
215 :
220 REM SET SCREEN COLOURS
225 GOSUB505
230 :
235 REM ROTATE SCREENS
240 DO
245 POKEGC,(PEEK(GC)AND199)OR8:GOSUB300
250 POKEGC,(PEEK(GC)AND199)OR16:GOSUB300
255 POKEGC,(PEEK(GC)AND199)OR24:GOSUB300
260 POKEGC,(PEEK(GC)AND199)OR32:GOSUB300
265 POKEGC,(PEEK(GC)AND199)OR40:GOSUB300
270 POKEGC,(PEEK(GC)AND199)OR48:GOSUB300
275 LOOP
280 :
285 REM SUBROUTINES
290 :
295 REM DELAY
300 TT=TI+T
305 DOUNTILTI>TT:GOSUB325:LOOP
310 RETURN
315 :
320 REM SET DELAY
325 GETK$:IFK$<>""THENT=2*VAL(K$)
330 RETURN
335 :
340 REM ADDRESS FOR COPY
345 POKE827,(SC*8+8)*4
350 REM CALL MC COPY SUB
355 SYS818
360 RETURN
365 :
500 REM POKE SCREEN COLOURS
505 FORLP=1TO5
510 READSX,FX,SY,FY,C0,B0,C1,B1
515 FORCO=SXTOFX:FORRO=SYTOFY
520 POKE7168+(RO*40)+CO,C0-1+((C1-1)*16)
525 POKE6144+(RO*40)+CO,B1+B0*16
530 NEXTRO,CO,LP
535 RETURN
540 DATA0,7,0,24,12,6,5,3
545 DATA32,39,0,24,12,6,8,7
550 DATA8,19,0,11,4,6,10,4
555 DATA8,19,12,24,3,4,8,7
560 DATA20,31,12,24,5,6,7,2
565 :
700 REM DRAW PICTURE
705 SD=5-SC
710 GRAPHIC1,1
715 CIRCLE,160,95,45
720 CIRCLE,160,95,70
725 CIRCLE,160,95,90
730 FORDR=0TO360STEP60
735 DRAW,160,95TO45;10*SC+DR
740 DRAW,160,95TO45;10*SC+DR+30
745 LOCATE160,95:LOCATE42;10*SC+DR+5
750 PAINT
755 LOCATE160,95:LOCATE45;10*SD+DR
760 DRAWTO25;10*SD+DR
765 LOCATE160,95:LOCATE45;10*SD+DR+30
770 DRAWTO25;10*SD+DR+30
775 LOCATE160,95:LOCATE68;10*SD+DR+5
780 PAINT
785 LOCATE160,95:LOCATE70;10*SC+DR+30
790 DRAWTO20;10*SC+DR+30
795 LOCATE160,95:LOCATE70;10*SC+DR+60
800 DRAWTO20;10*SC+DR+60
805 LOCATE160,95:LOCATE80;10*SC+DR+35
810 PAINT
815 NEXTDR
820 CIRCLE0,160,95,45
825 CIRCLE0,160,95,70
830 CIRCLE0,160,95,90
835 CIRCLE,288,SD*30+30,20+SC*2
840 PAINT,288,SD*30+30
845 CIRCLE,31,SC*30+20,20+SC*2
850 PAINT,31,SC*30+20
855 RETURN
```

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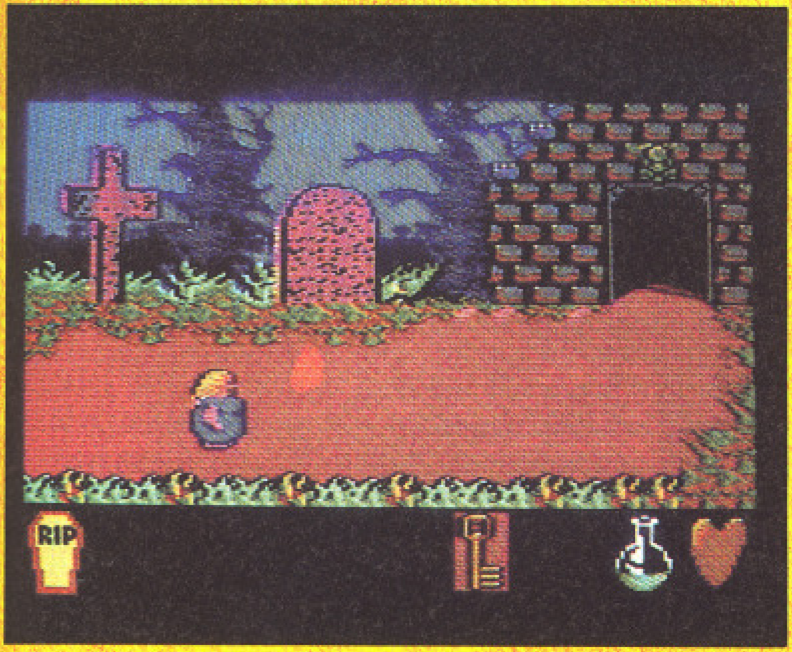
Games Reviews

Here's a selection of the most recent software available.

BRIDE OF FRANKENSTEIN

It was dark and wolves could be heard howling in the distance and the moon projected her great white shadow across the moors. Thunder boomed and lightning crashed. In the cemetery there was one lonely figure, the Bride of Frankenstein who stood frantically digging a grave searching for bits of decaying corpses to put in her husband.

Ariolasofts new game puts you in control of Frankenstein's bride, the only trouble is that she can't marry him until he is alive, but he needs emergency surgery as he has not got a heart, brain, kidneys and other vital organs.



How would you like to marry someone lacking these?

So off she goes to rebuild her hubby. First she will need to get the right keys to open doors to different parts of the castle - there are seven altogether but she can only carry one at a time, which makes things difficult.

She will also need a shovel to dig the graves and get the second-hand bits and bobs from the corpses.

Another important item is the lamp which you will need in order to enter the crypts which are otherwise totally black. If you manage to find the pickaxe you can have a smashing time in here, and you may even be able to defend yourself from the ghouls and skeletons which scare you slowly to death when they touch you.

You are given only one life to complete the game, and this is represented by a beating heart, that beats faster and faster until it explodes, depending on how many times the ghouls touch you.

The castle is made up of 60 rooms which are full of puzzles and traps, it will be a long while before you manage to explore them all.

The sound is not too bad, with a few spot effects and the sound of your heart beating which adds to the atmosphere of the game. On the title screen a rendition of toccata plays with Frankestein chained to the wall in the top of the castle with lightning flashing now and then.

Frankenstein is not a bad game, although it does grate a little in the lives department and can be quite frustrating at times. A few times I had all the objects, only to enter a room and get trapped in the door by a ghost (most annoying) and killed almost straight away. I promptly turned it off in frustration, only to load it up half an hour later.

All that aside, I enjoyed Frankie's Bride, the game is very addictive and not for the weak-hearted. **K.R.**

Touchline:
***Name:** Bride of Frankenstein. **Supplier:** 39 steps/Ariolasoft. **Tel.** 836 3411. **Machine:** C64. **Price:** £9.99 (ca), £12.99 (d). **Originality:** 7/10. **Playability:** 6/10. **Graphics:** 7/10. **Value:**7/10.*

GOBOTS

Last summer, during the summer holidays, that well-known children's program, Wac-A-Day ran a cartoon series called the Gobots. And almost a year on they are still showing it.

The cartoon tells the story of two kinds of robots, the good guys are the Gobots and the bad guys who are controlled by the evil Gog. They have been sworn enemies for many, many years and now the evil Gog has decided that he wants to take over the Earth.

He has built huge bases on the Mobius planet, which will



produce clones of your good buddy (true American style eh!) Scooter. He will then use these to cause havoc on the Earth and give the Gobots a bad name.

Well, the Gobots could not let this happen so the most important Gobot, Leader One, sets out to put an end to these evil plans and to rescue Scooter. Being a Mobius planet it has a ceiling and a floor and both have gravity – very weird.

Your objective is to destroy all the green bases in each wave of the game. To blow these to bits you will need to pick up the Scooter clones and they will become missiles which you can use to wipe out the bases. While you are doing this you are being constantly attacked by helicopters and meanies which try to ram you There are also robots that beam from one surface to another and they cannot be shot, so avoid them.

Throughout the game you will be harassed by a large number of aliens and robots, which makes the game harder as you go along.

I was impressed by the game as it was original in the way it is played, with the Mobius planet.

I can recommend Gobots to you, especially if you are a fan of the cartoon. Another addictive and playable game from Ariolasoft. **K.R.**

Touchline:
Name: *Gobots.* ***Supplier:*** *Ariolasoft.* ***Tel.*** *01-836 3411.* ***Machine:*** *C64.* ***Price:*** *£9.99.* ***Originality:*** *8/10.* ***Playability:*** *9/10.* ***Graphics:*** *7/10.* ***Value:*** *8/10.*

HEAD OVER HEELS

The latest offering from Ocean owes quite a bit to Ultimates Knite Lore; remember the game that caused a stir on the Spectrum with its wonderful graphics and superb gameplay? Not to worry though, it's better than Knite Lore, so read on.

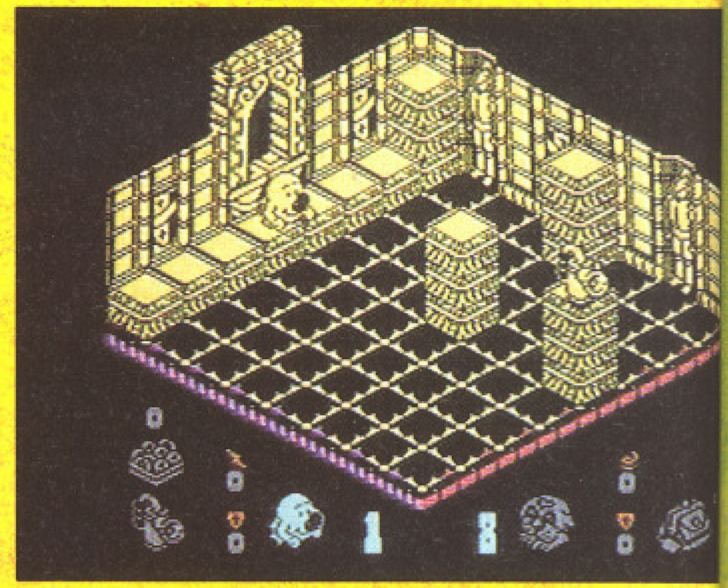
You play the part of two characters – one called Head and one called Heels. Apart, they are pretty useless, but together they make a great team, and that is your first task; to get them back together.

You are sent to the rebel slave planets by the people of the planet Freedom, with Head and Heels being highly trained spys sent to the Blacktooth empire to cause a revolution amongst the slaves that have been caught by th Blacktooth.

The planets come in many different forms and created for Blacktooths bad taste. Egyptus is the firs Once, a long time ago a Blacktooth spaceship got lost doing a hyperspace jump and landed on an unknown p Here the crew found a primitive animal forming a s civilisation that appeared to revolve around wra corpses in lots of bandages and putting them into huge pyramids. When they returned to Blacktooth their em liked the sound of it so much that he rebuilt the entire c city of one of the slave planets to resemble the story

The next and even worse planet is Penitentiar empire's prison planet. Millions are imprisoned he harsh planet, which is very mountainous and where climbing skill is required. The worst place is The Pit, t to fall into it, or else!

Another weird place to visit is the totally freaky World. The emperor is very keen on western and co books, and has devoted an entire world to them, hence World. Only the emperor's minions are permitted to them as information is very suppressed in the emp Blacktooth. Safari World is another nasty place, (n kind of place to picnic).



It is a very green planet with plants galore and is n used for hunting. It is also inhabited by natives who wooden forts. You must also be careful of the traps are scattered around as these prove to be a great hind

And last but not least, the fearsome Blacktooth planet has a large moon with three space stations on biggest one is moon station HQ and this is where yo teleport to the different planets. You can of course be coward and choose to escape, leaving all those poor doomed to die, or you can liberate each planet in th retrieving the crown. Stealing the crowns from each pl no easy task, as they are guarded by huge monsters tha to be defeated (*hint*: they hate doughnuts) before yo claim the crown.

To help you on your mission there are various c such as the White Bunny who will give you magical p the Reincarnation Fish can lie and if eaten will reinc inside you. If you die you can continue from where y the fish and this fish likes to be eaten!! (Confused, yo be.)

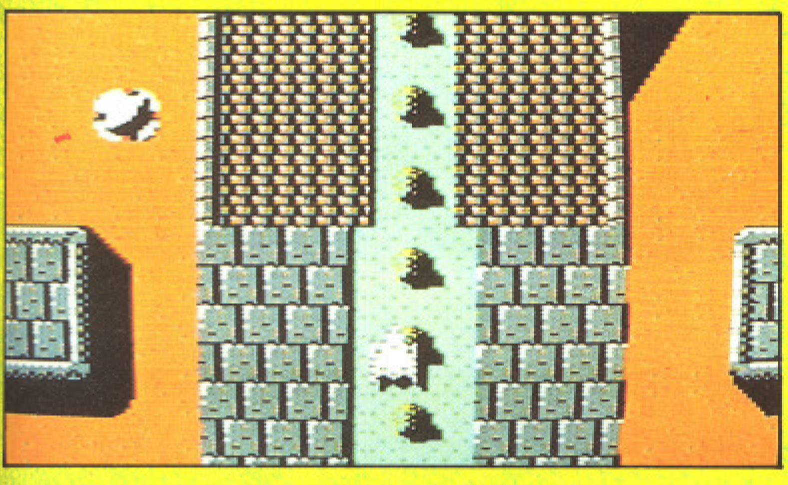
For amunition you will need a hooter and doug (remember the *hint*? When you have both you can sho

nasties, as they will freeze while trying to lick the dough off their face.

Well, that about wraps it up and as you can see there is plenty to do in this game and it is sure to keep you hooked for a long time.

Yet another super cool game from Ocean, hot on the heels of Wizball and Slap Fight. If Ocean keep this up they're bound to become the top software house. **K.R.**

Touchline:
Name: *Heads over Heels.* ***Tel:*** *061-832 6633.* ***Machine:*** *C64.* ***Price:*** *£8.95.* ***Originality:*** *8/10.* ***Playability:*** *10/10.* ***Graphics:*** *9/10.* ***Value:*** *8/10.*



SLAPFIGHT

At last one of my favourite arcade games has been released, if you haven't seen Slapfight in the arcades where have you been for the last year, huh?

Slapfight does not involve any slapping or such like, in fact it does not refer to the game at all, which is a fast and furious shoot'em-up.

The idea is to pilot a slow-moving spacecraft across an alien planet, with the goal being to reach a giant complex in the centre of this strange world and blow it to bits.

As you can imagine this is not an easy task as there is a lot of ground to cover.

You can build up your spaceship by collecting stars that are dropped when enemy ships are shot, but not all of them drop these. The weapons available are: speed, which will give you up to five times the normal speed (depending on how many stars you pick up); shot will give you normal firepower if you have lazer or H. missiles; side will give you power beams on the side of your ship which will melt any alien that gets too near. The Wing will extend the size of your ship and enhance your fire by one; bomb is next but this is a weak weapon and iffy to use. The next is the lazer which fires an invisible beam, a good buy. The Homing Missiles are the ultimate weapon, press the button and eight missiles will zoom into the targets – brilliant. Last but not least comes the Shield, get his and you won't have to worry about getting blown up by aliens (for a while anyway).

I enjoyed playing Slapfight as it's addictive, colourful, and most importantly close to the arcade version. The music however is dreadful and bland, no doubt you'll be racing for the volume button but don't let this put you off, you can still have sound effects.

Stop putting your money into the arcade version, do yourself and your Commodore a favour and buy Slapfight. **K.R.**

Touchline:
Name: *Slapfight.* ***Supplier:*** *Ocean.* ***Tel.*** *061-832 6633.* ***Machine:*** *C64.* ***Price:*** *£8.95 (ca), £12.95 (d).* ***Originality:*** *5/10* ***Playaility:*** *8/10.* ***Graphics:*** *7/10.* ***Value:*** *8/10.*

HADES NEBULA

Oh no, not another shoot'em-up, ahhhhhh! Hang on, look at the graphics – wow. Quick, pass me that joystick, pow blam, boom, yeah this is great, can I have another go?

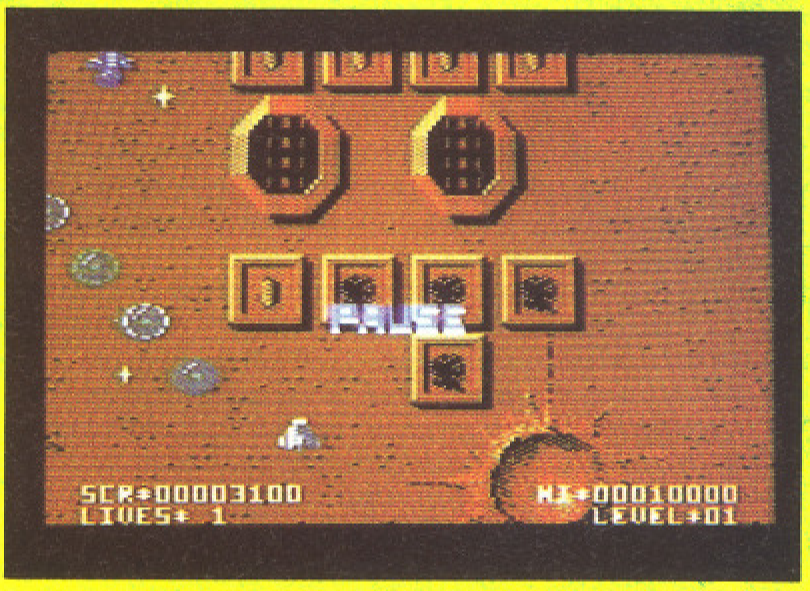
I've just played Hades Nebula and I can't stop. This is the new game from Nexus, and a very good one at that. The story behind this awesome game goes like this. It's 2124 and not a good year. Just about everything that makes life pleasant is running out or running down. The serious people at WEC (that means World Energy Committee) have formulated The Plan to get round the problem.

The plan is WEC Colony plan, it involves ten really big, like mega-huge, colony ships. They're going to use a Meason Accelerator (a go-faster gadget) to throw them to the far corners of the universe. A long way, 'cos that's where the energy is.

Well, that was the idea, but thanks to the totally evil overlord Hades, all your fleets were killed off, leaving only you to brave the long journey that lies ahead. You must penetrate his Kingdom that although once peaceful is now crawling with aliens intent on blowing you to bits.

While you try to avoid the aliens and their lasers you must also shoot panels on the floor which contain gadgets for your ship, released by the rebel miners enslaved by Hades. There are quite a few extras that can be used for your ship such as Speed, which will double your speed. Also rotators, which can be fitted to the side or front of your ship, which will kill any foolhardy aliens foolish enough to get too near. Lasers come in two forms – tri-lasers, which fire in three directions, and normal lasers, which will fire upwards killing any aliens that cross its path, (gasp!).

You can also have Warp, which will warp you out of any



tricky spots that you may get yourself into. Powerwings are next on the menu and, these will increase your fire power vastly, but they also make you more vulnerable as the ship will also grow in size.

I liked Hades Nebula very much as it has that 'just one more go' appeal. Also some stunning graphics mixed in with a touch of good presentation, which left a nice taste in my mouth.

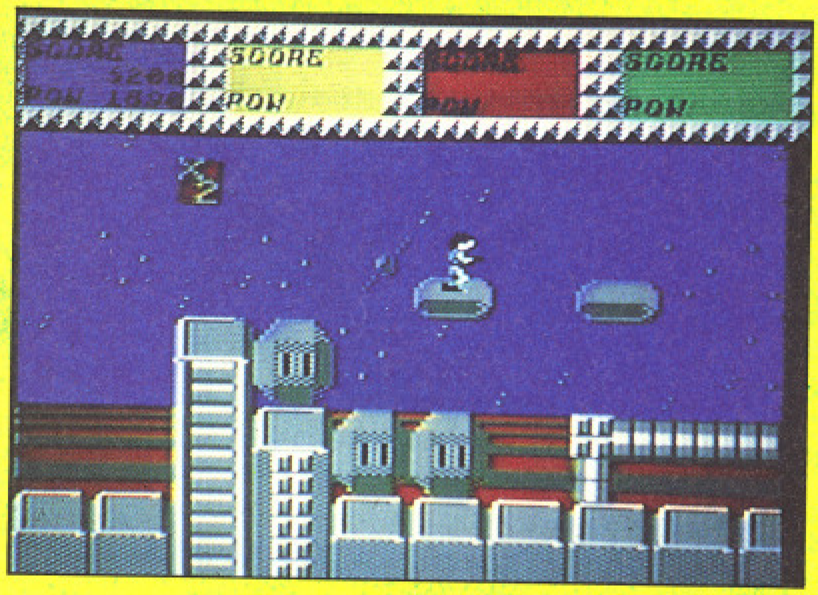
I would not recommend this if you already have Tera-Cresta or games or that kind, but if you haven't then get this, it will keep you hooked, that is until you get frustrated by the diifficulty of the game, but you will soon load it back up again. **K.R.**

Touchline:

Name: *Hades Nebula.* ***Supplier:*** *Nexus.* ***Tel:*** *01-658 5723.* ***Machine:*** *C64.* ***Price:*** *£9.95 (ca), £12.95 (d).* ***Originality:*** *6/10.* ***Playability:*** *6/10.* ***Graphics:*** *10/10.* ***Value:*** *7/10.*

QUARTET

When terrorists capture a space colony there's only one thing you can do, send in the Quartet (the galactic equivalent of the A-Team). Edgar, Lee, Mary and Joe form the meanest, toughest and deadliest team in the Universe (it's just as well they're on our side) that are the stars of the four player coin-op game Quartet. In this C64 conversion either one or two players can play one or two of these heros and go and trash some space pirates.



Although zapping the pirates forms an essential part of your mission the real task is to get through the game's 22 levels. To complete a level you must battle your way through past the hordes of pirates to the exit that's guarded by a giant mechanical monster. Destroy this with several repeated hits and you'll get the key and a bonus score.

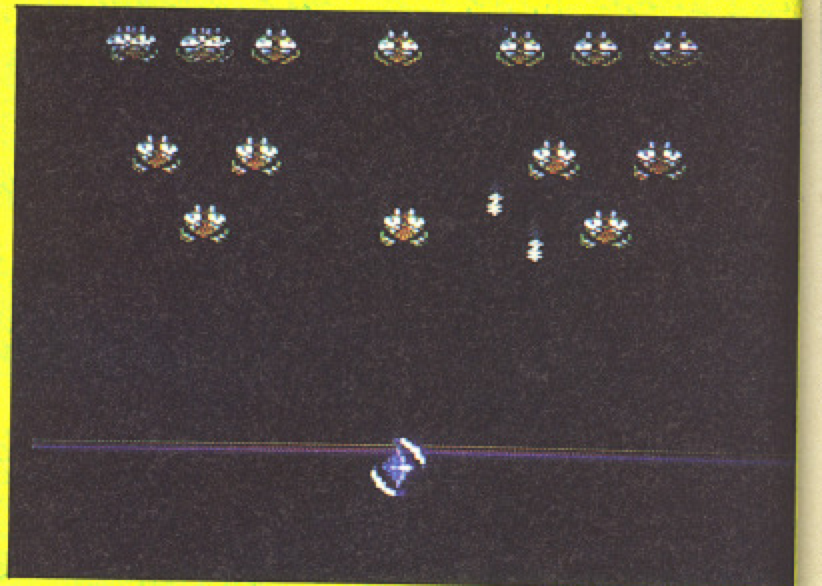
Each level consists of a series of sideways scrolling screens reminiscent of Gremlin's Future Knight full of platforms and ladders for you to climb around and doors for the pirates to stream through. Help is at hand either from a second player who should work together with you and not dive in to steal the objects that might keep you alive long enough to complete the level. These objects include springs to give you extra jump, shields to protect you for 15 seconds, jet packs to reach the parts other players can't reach and smart bomb potions to clear the screen.

Each member of the Quartet has slightly different characteristics that may help or hinder your choice. Edgar can jump higher than the others, Lee is the best shot, Mary is mean with her bazooka and Joe is the fastest on two legs.

Although Quartet is great fun to play it lacks the depth and variety of that other great four player coin-op game Gauntlet which will remain my favourite. **T.H.**

Touchline:

Name: *Quartet.* ***Supplier:*** *Activision.* ***Tel. 01-431 1101.*** ***Machine:*** *C64.* ***Price:*** *£9.95.* ***Originality:*** *5/10.* ***Playability:*** *8/10.* ***Graphics:*** *6/10.* ***Value:*** *7/10.*



KILLER RING

Reaktors Killer Ring owes more to classic arcade games such as Space Invaders, Galaxians and Centipede than any giant step forward in computer gaming.

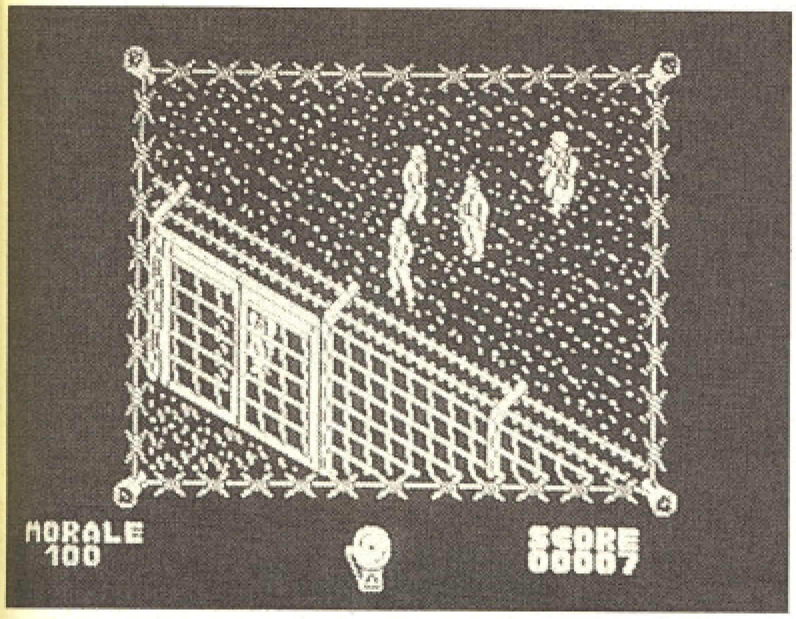
The Killer Ring is in fact your spinning zapping ship that must blast anything that moves as well as anything that doesn't move! The moving and non-moving blastable objects look remarkably like Galaxians except when they sit down, fold in their wings and do crab walking space invader impressions. If you have your way they'll soon be perfecting corpse impressions.

In screen three the galaxians/invaders are replaced by a centipede supported by some revolving aliens that have anti-laser shields so you have to aim for the gaps to destroy them. Screens five and six feature giant blue balls that seem to lay galaxian/invaders and finally screen seven features a massive spaceman that you must blast away at until you destroy his heart while avoiding the onslaught of galaxian/invaders.

The game is quite easy, even on the hard level where you must blast your way through an anti-matter beam before you can zap the aliens, but makes a welcome change if you want a quick zap before tackling something more serious. **T.H.**

Touchline

Title: *Killer Rings.* ***Supplier:*** *Reaktor.* ***Machine:*** *C64.* ***Price:*** *£4.99.* ***Originality:*** *2/10.* ***Playability:*** *7/10.* ***Graphics:*** *5/10.* ***Value:*** *6/10.*



THE GREAT ESCAPE

For you ze Var is over! It's 1942 and you're a prisoner of war but as an officer you set about your duty to plan and execute the great escape!

The POW camp you're in is an old castle that's surrounded on three sides by sheer cliffs and the sea and is packed with patrolling guards led by the camp Kommandant. There are, of course, other prisoners but most of them have been here too long and just follow the roll call, exercise and eating routine of prison life. If you don't do something quick you'll slump to that level as well and the game will end.

As the game begins the camp security is fairly slack and you should follow the routine to plan when you're least likely to be missed. During these times you can slip off unnoticed to do some exploring. During these excursions you'll find objects that may be useful as well as some of the tunnels that form a labyrinth under the castle and your best chance to get to key off limits areas and finally to escape.

If you miss roll call or are found in the wrong place then the alarm will go and if caught you'll spend the night in solitary and lose some morals. This starts at 100 and drops when you're caught, but can be topped up by finding objects and exploring. However, if it gets too low you'll find it difficult to regain control of your prisoner as he falls into depression.

Actually mounting an escape attempt will take planning, the right objects and the knowledge and timings of guard patrols. Get it right and you could be home soon but get it wrong and the war for you will be over.

A great game from Ocean. T.H.

Touchline:

***Name:** The Great Escape. **Supplier:** Ocean. **Tel.** 061-832 6633. **Machine:** C64. **Price:** £8.95 (ca), £12.95 (d). **Originality:** 8/10. **Playability:** 8/10. **Graphics:** 7/10. **Value:** 8/10.*

KAT TRAP

Two centuries have passed since man left a doomed Earth that was wrecked by solar explosions. They returned hoping to find an inhabitable planet, instead they found one that was inhabited! The Cat Men had invaded.

The job of ousting the invaders naturally falls to you a M.T.-ED robot and your companion Hercules1. Unfortunately, the Catmen ambushed you as you landed and Hercules 1 has been captured. You're now alone in your mission to destroy the Catmen's battle computer.

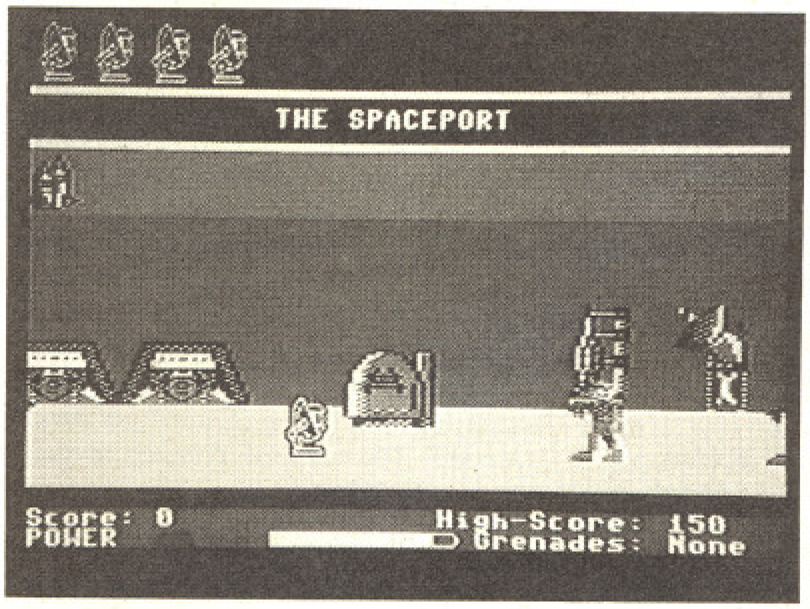
The action takes place on the desolated cities and landscape of the ruined planet that are not only guarded by the Catmen themselves but also the mutants such as the Fire Demons, Icemen, Shadowman and Sewer beasts that they've pressed into service.

You're not completely alone as the Earth forces drop supplies and new weapons for you to collect. These are essential as you need the right weapon at the right time to survive long enough to kill the critters. This is tricky since the weapons are usually surrounded by a horde of Catmen.

Of all the mutants and catmen that amble across the screens, the Sewer Beasts are my favourite as their hands suddenly leap up through manholes to grab you. The least popular critters are giant boulders that literally bowl you over and impossible to get past. Kat Trap's good but don't expect too much from it. T.H.

Touchline:

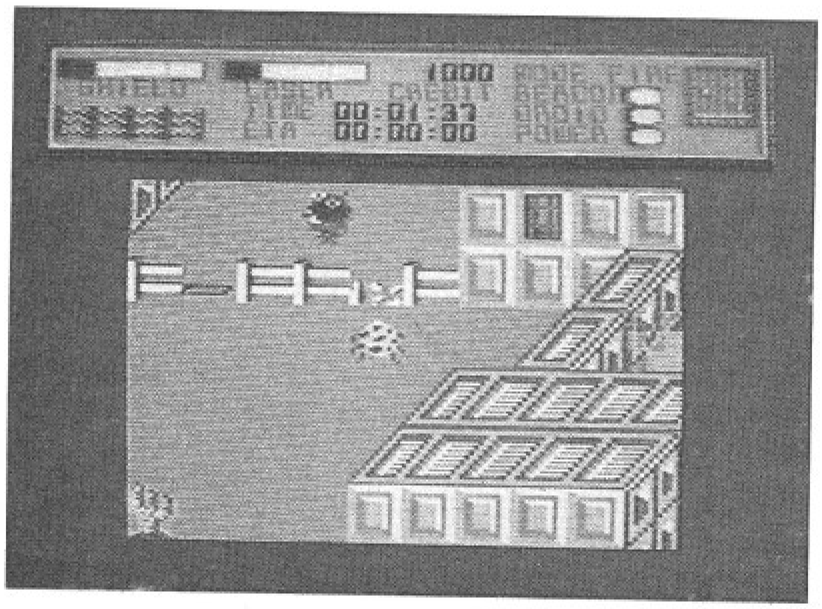
***Name:** Kat Trap. **Supplier:** Streetwise. **Machine:** C64. **Price:** £8.95 (ca), £11.95 (d). **Originality:** 6/10. **Playability:** 6/10. **Graphics:** 6/10. **Value:** 6/10.*



COLONY

When the world got overpopulated man took to the stars and colonised other planets. You are a work droid on the coldest, bleakest and most hostile planet to be occupied. It is your job to sow seeds and harvest the ripening mushrooms while fighting off the onslaught from the planets chomping insect inhabitants.

The colony consists of a fenced enclosure containing store rooms, seed beds to grow the mushrooms and solar panels to produce the energy you need to activate the beacon that will attract the supply ship. Unfortunately, your normal routine of planting seeds and harvesting mushrooms is soon interrupted as the alien insects are rapidly gnawing their way through the fences that you must replace.



You have a laser and a shield to combat this onslaught but these need recharging from your power source which is reduced if the critters chomp the solar panels. However, if you spend too much time fighting aliens and repairing fences you won't be able to grow any mushrooms which means you won't raise enough cash to buy more seeds and fences and panels and the colony will die.

Your demise is the only end to the game which is greeted by a poor Python like 'Your an ex-droid' message and the knowledge that you lasted for so many minutes. No score, just the time you survived and the money you raised. Surely there must be more to colonisation of alien worlds than growing mushrooms and killing beetles! T.H.

Touchline:
Name: *Colony:* ***Supplier:*** *Bulldog.* ***Machine:*** *C64.* ***Price:*** *£1.99.* ***Originality:*** *4/10.* ***Playability:*** *5/10.* ***Graphics:*** *4/10.* ***Value:*** *5/10.*

KINETIK

Throughout the Universe the laws of physics remain constant except on the planet Kinetik. Here the laws of gravity vary from area to area and it's your job to halt the chaos and restore balance.

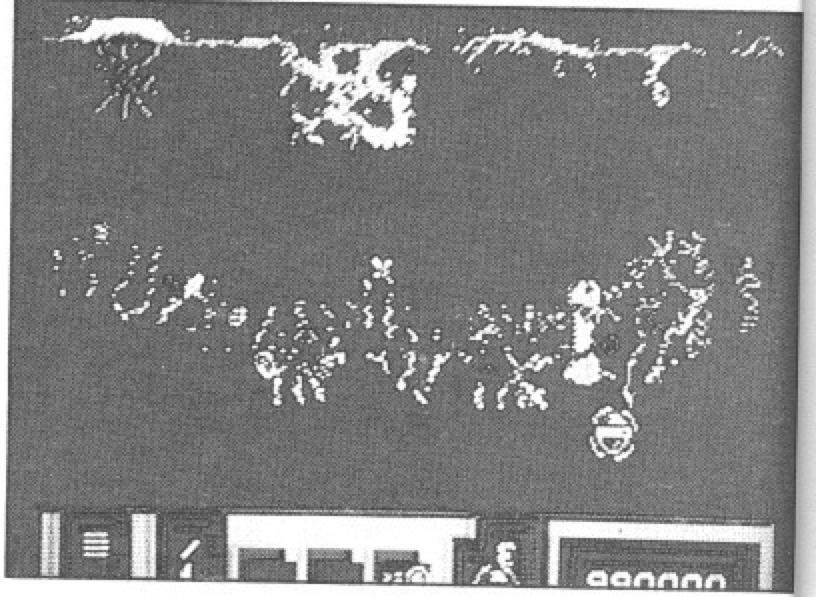
The planet is represented as a series of screens littered with alien plants, some of which are as deadly as the energy draining critters that attempt to mug you.

You travel through the screens in a rotating hydrocraft that is protected to withstand the dramatic changes in gravity and most of the collisions with the planets surface. It can also recharge its energy cells by immersing itself in the planet's pools of water.

You can also improve your chances of survival and of completing the game by collecting equipment pods. These include a deflector shield that protects you from the alien life, a chemical spray to blast the critters, anti-gravity thrusters to counteract the changing gravity and a teleporter to jump from one screen to another. Unfortunately, your ship can only carry three of these devices at once and only one can be active at any one time.

Undoubtedly, Kinetik is an extremely difficult game to play and will take many sessions to complete it especially if the thief strikes at just the wrong time and steals a crucial piece of equipment just when you need it. If you like your games to be tough then you'll enjoy (if that's the word) Kinetik. T.H.

Touchline:
Name: *Kinetik.* ***Supplier:*** *Firebird.* ***Tel.*** *01-631 5206.* ***Machine:*** *C64.* ***Price:*** *£9.95 (ca), £12.95 (d).* ***Originality:*** *6/10.* ***Playability:*** *7/10.* ***Graphics:*** *6/10.* ***Value:*** *7/10.*



ESCAPE FROM PARADISE

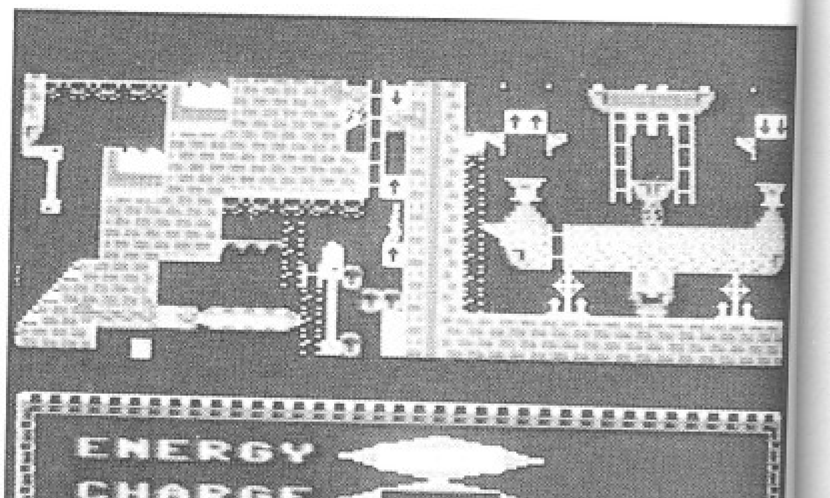
When this game first loaded up I thought, what a load of old rubbish it was, but I persevered and it began to appeal to me. The first thing I noticed was the tiny graphics and matchstick man, then a smart tune started to play and when I moved the tiny figure the animation was great (impossible mission style). So I started to play, got killed and had another go, and it went on like that for quite a while.

But sadly it proved too hard for me as I kept getting stuck in the same place, which was quite annoying.

But don't get me wrong, I still like it, as it's one of those games that you keep coming back to.

You play the part of Joe, a man who has it made. He has his very own multi-million pound complex hidden deep underground. One day, however Joe wakes up to find himself with a hangover from the bubbly and discovers hundreds of aliens have invaded his home. So what can he do? Escape from his paradise.

Apart from the Spectrum 'Tiny Char' graphics, this game doesn't look too bad.

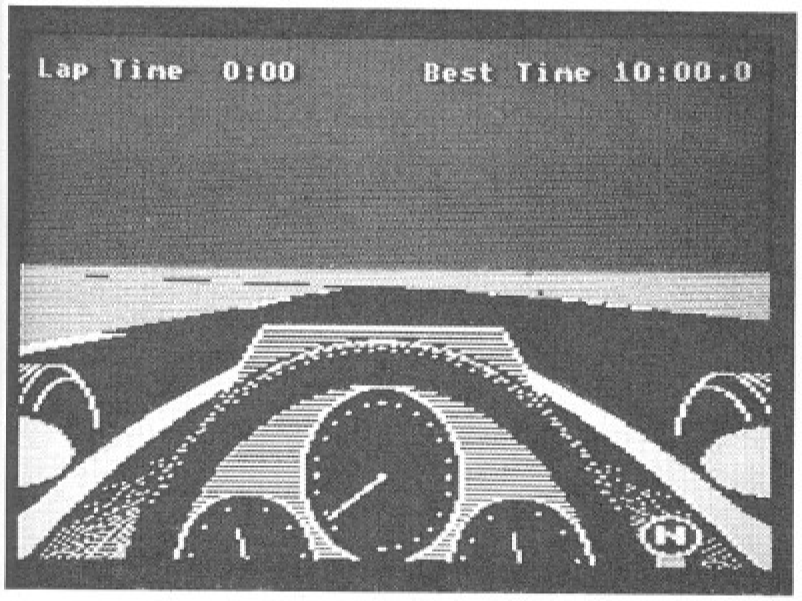


Joe is well animated and flicker-free and scrolling is nice and smooth.

A frustrating game with tiny graphics, clear animation and good sound, but at just under ten pounds I would stay clear of it. But check it out yourself – you might like it!

Touchline: **K.R.**

Name: *Escape from Paradise.* ***Supplier:*** *Anco.* ***Tel.*** *0322 92513.* ***Machine:*** *C64.* ***Price:*** *£7.95 (ca), £9.99 (d).* ***Originality:*** *5/10.* ***Playability:*** *4/10.* ***Graphics:*** *6/10.* ***Value:*** *4/10.*



REVS +

Have you ever played a game and then thought 'why did they do that' or 'why didn't they leave out the fourth level?' People who played Revs did; they sent in their suggestions and have had them included in Revs +.

The original Revs was undoubtedly the most realistic C64 racing game when it was released last year. Since then players have realised that you had to be a world class racing driver to play it! It featured an incredibly detailed version of the classic Silverstone course with every bend in tyre squealing detail mainly due to a certain David Hunt (formula three racing driver and James Hunt's brother) helping out with the game.

Revs + has all those features plus a few new ones to help the beginner and four extra tracks to tackle the experts. Now you can play Revs + with any joystick or the keyboard and beginners can enjoy the luxury of assisted steering to get you around the tricky corners. Plus, once you've mastered both Silverstone and Brand's Hatch you can try out Donnington Park, Snetterton and Oulton Park as well as the Nuberg Ring which is widely acknowledged as the toughest drive in Europe.

Revs + is fast and realistic (once a car is overtaken it stays overtaken and doesn't teleport to meet you around the next corner) and it's nice to be able to use an ordinary joystick, but why didn't Firebird get it right the first time? We shouln't have to pay again to get a finished version!!!

T.H.

Touchline:

Name: *Revs +.* ***Supplier:*** *Firebird.* ***Tel.*** *01-631 5206.* ***Machine:*** *C64.* ***Price:*** *£9.95 (ca), £12.95 (d).* ***Originality:*** *4/10.* ***Playability:*** *7/10.* ***Graphics:*** *6/10.* ***Value:*** *4/10.*

WIZ

There are two worlds of lightness and dark that touch on the Magical Isle. Evil is pouring forth and even you, a mere first level wizard, can see that some monumental cataclysm is likely to be forthcoming.

The only people who don't seem able to see are your masters, the council of Wizards. They seem content to play at ostriches and stick their heads in the sands. Nor are they too pleased when you decide to take matters into your own hands. They cannot prevent you from advancing as a wizard, but they have removed your protective shielding so that you become vulnerable to attack.

Any wizard worth his salt must have a fine collection of spells at his disposal. You start off with a few written into your spellbook and can learn others from itinerant wizards that you meet on your journey providing that you have enough power to assimilate the magic runes. You need to be careful which spells you learn though for your spellbook will only hold 20 different types. These include zap spells, teleports, tree pruning, bridge repairing and turning yourself into an evil proof bunny!

Runes are the stuff of which spells are made and you must learn how to assemble the ones that you want. Each spell has a formula – a sequence consisting of four different rune types. There is a limit to how many runes you can keep stored and others have to be acquired by use of, surprise, surprise, a rune spell. This kills baddies and converts them to runes but only two types can be found on each plane of existence.

It is essential to prepare your spells quickly for if you stay in one place too long, a Tracer appears. This malevolent beast is indestructible and will follow you on your journey. The best that you can do is to temporarily blast back to the Planet of Darkness.

The game itself is a Gauntlet clone with a top-down view of your surroundings. The graphics are large and clear and the puzzles to be solved. combined with the use of magic, add a pleasant twist to a well worked theme.

G.R.H.

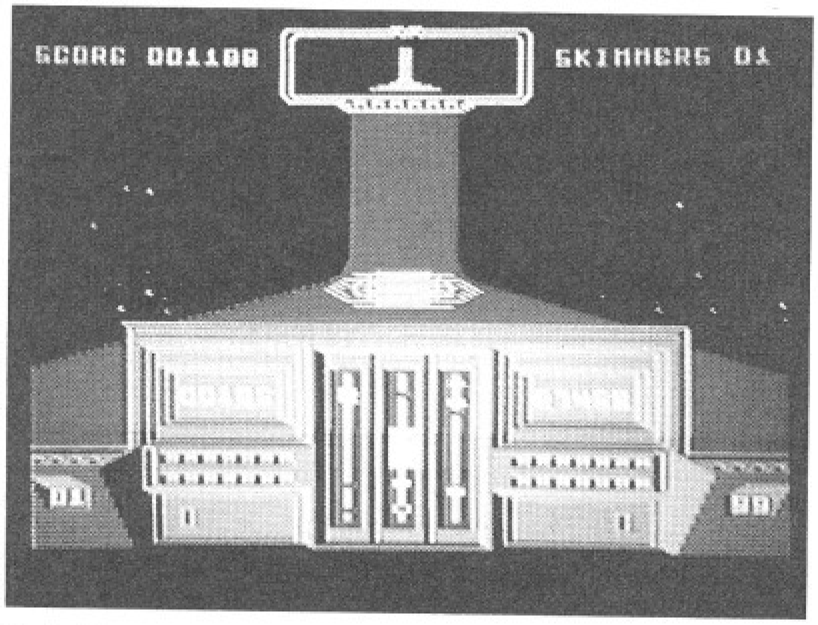
Touchline:

Name: *Wiz.* ***Supplier:*** *Melbourne House.* ***Tel:*** *01-377 8411.* ***Machine:*** *C64.* ***Price:*** *£8.95.* ***Originality:*** *8/10.* ***Playability:*** *7/10.* ***Graphics:*** *7/10.* ***Value:*** *7/10.*

DEAD RINGER

You can always tell when it's Summer, not just because the rain gets warmer but the software houses are keen to press bargains into your hot little hands. For example, Dead Ringer is one of the Reaktor games that are at a 'never to be repeated bargain price' of £4.99. It would be a bargain if the game was better than a poor average. It isn't.

Do you have what it takes to become a Dead Ringer? Can you survive the race on the Ring, a giant doughnut shaped racing stadium in your heavily armed and armour skimmer?



Probably not.

The racing track consists of four lanes that are graded from the easy inside track to the almost suicidal outside track. Unfortunately, the track appears on the screen as a featureless blue band that then turns green behind you as you can see through your rear mirror. Most of the game involves swapping tracks to avoid or blasting the hazards that appear before you.

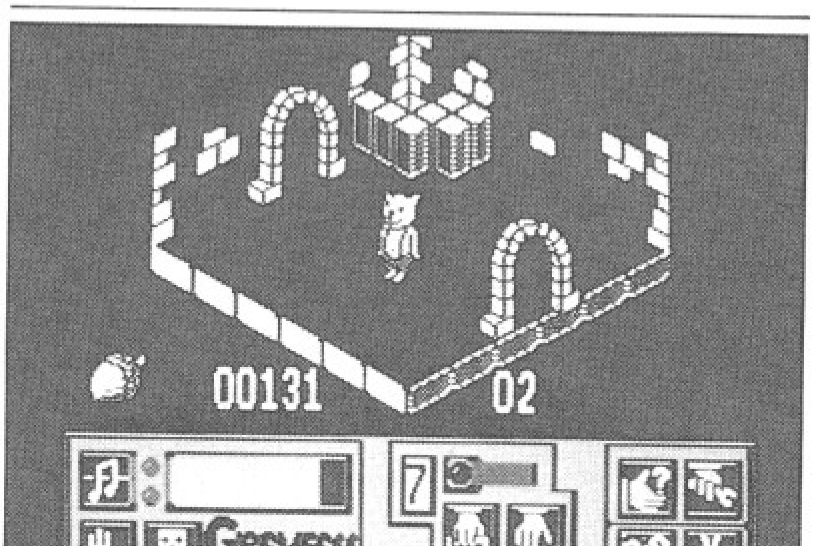
The most deadly objects are walls that destroy you on contact that are joined by one other skimmer that you must kill or be killed and mines that must be blasted before it blows you up into tiny pieces. Luckily, there are also ammo dumps to restock your weapons and warp gates to get you to top speed.

The whole game is as flat as a pancake (rather than a doughnut) and would barely survive as a budget game. At £4.99 it's no bargain and about as exciting as a wet August bank holiday.

T.H.

Touchline:

Name: *Dead Ringer.* ***Supplier:*** *Reaktor.* ***Machine:*** *C64.* ***Price:*** *£4.99.* ***Originality:*** *5/10.* ***Playability:*** *4/10.* ***Graphics:*** *4/10.* ***Value:*** *4/10.*



GREYFELL

The Orb of Life has been stolen by the evil sorceror Mauron who has hidden it deep within his stronghold. As long as it remains in his possession, he can control the feelings of the people in Greyfell and, being evil, he naturally decides to banish all laughter and merriment from the kingdom.

You are Norman, a mangey moggy, quietly getting drunk in a corner of your local tavern. Drinking the ale and listening to tales of various legends, you come over all peculiar and decide to announce to the assembled customers that you, Norman, will go forth and free the people.

And so your quest begins in typical arcade adventure fashion. Wandering round the area, picking up hopefully useful items, solving puzzles and duffing up the local henchmen – the usual assortment of killer tomatoes, cat-eating plants and rats falling out of trees. Rumour has it that there are also a few diehards in the forest who are actually on your side. These include a drunken rabbit called Blotto and Hitormis, an owl wizard.

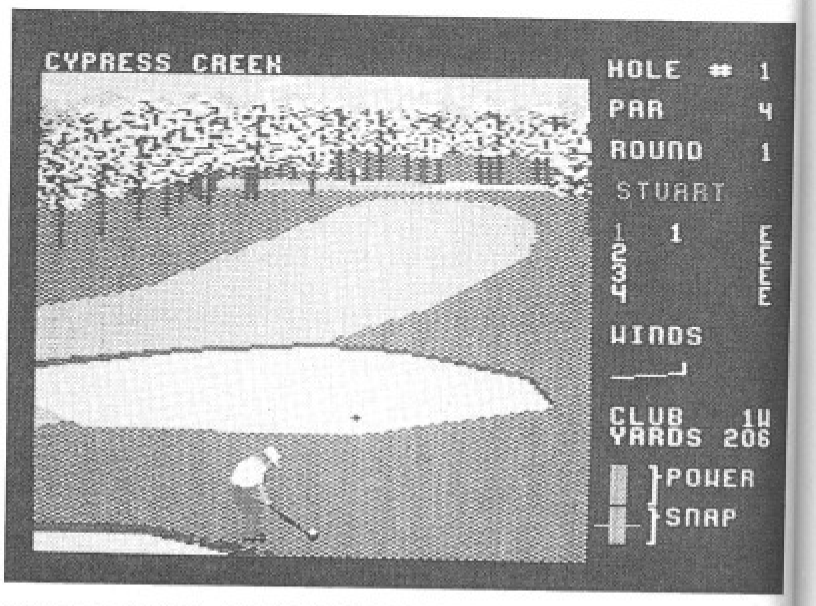
The game is controlled using a series of icons. Normally you can move round thumping opponents, but if there is no-one standing next to you, a press of the fire button allows you to select and fire spells and manipulate the various objects that you have acquired. Graphically, the game looks exactly like one of the hundreds of 3-D Spectrum arcade adventures that have been released since Ultimate first released Knight Lore.

Gameplay is very slow and I found the system of icons poorly defined and unwieldy to use. Similar problems were encountered with identifying objects on the main screen. Not a great game, but not bad either and it may appeal if you enjoy this sort of thing.

G.R.H.

Touchline:

Name: *Greyfell.* ***Supplier:*** *Starlight Software.* ***Machine:*** *C64.* ***Price:*** *£9.99.* ***Originality:*** *5/10.* ***Playability:*** *4/10.* ***Graphics:*** *6/10.* ***Value:*** *4/10.*



WORLD CLASS LEADERBOARD

Just when you thought that you had mastered every last bunker and water hazard on US Gold's excellent Leader Board series, they come up with yet another variation on a theme. World Chess Leader Board is the most challenging variation yet and several new features have been introduced into the gameplay.

For any of you who missed the original games, WCLB is a golf simulation. You must select your club and then judge the power and timing of your swing in order to hit the ball to the best effect. There are the usual hazards of water, sand and trees to be avoided as you hack your way round the course, trying to achieve as low a score as possible.

WCLB offers you four courses, three taken from real life (St. Andrews, Doral Country Club and Cypress Creek), together with one especially constructed for the occasion – The Gauntlet. There is also a partial course designer with which you can access any of these 72 holes and put together your own courses. You can make minor changes to these holes such as changing the type of trees but, somewhat disappointingly, you don't have complete control of what goes where. No doubt that will come out in the next version!

There are three skill levels to choose from – kids, amateur and professional. With the courses being as tough as they are, you have to be pretty good to play at professional level. Whereas on previous versions, I could blast my way round in just about level par, my first two rounds here were plus twelve and I'd rather not say.

One reason for this is that you don't now get any assistance when you are putting, as to how hard you have hit the ball. The sliding scale stops after the first marker leaving you to judge the rest. Not having read the instructions and thinking that it was a bug, my first putt took me straight off the green and back into a bunker!

Other features include a top down view of each hole available at the press of a key, driving, practice putting ranges and print-out facilities.

The big question with WCLB is should you buy it if you already have one of the earlier versions. If you enjoyed the game, then my answer is yes. This is sufficiently different to give value for money. If you don't already own a golf game, then I have no hesitation in recommending this as the best and most challenging game you can buy. Until the next version comes out (how about a Martian course with variable gravity?)

G.R.H.

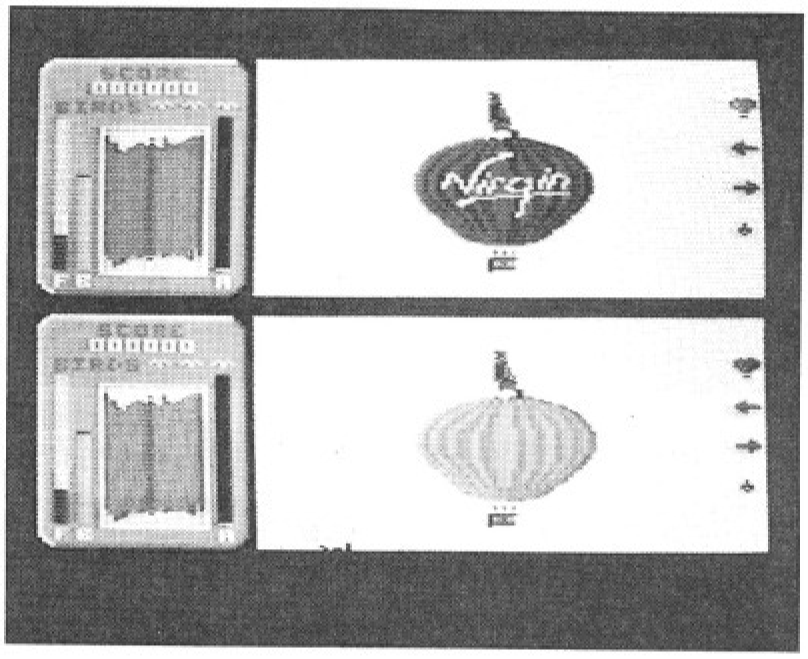
Touchline:

Name: *World Class Leader Board.* ***Supplier:*** *US Gold.* ***Tel:*** *021-356 3388.* ***Machine:*** *C64* – disk only. ***Price:*** *£14.99.* ***Originality:*** *5/10.* ***Playability:*** *9/10.* ***Graphics:*** *9/10.* ***Value:*** *8/10.*

BALLOON CHALLENGE

There have been simulations covering all forms of air transport; helicopters, jets and even gliders. With Richard Branson attempting to cross the Atlantic in a balloon, you might be forgiven for assuming that Transatlantic Balloon Challenge was in the same sort of mould. How wrong could you be.

Instead, Virgin Games have come up with a truly dreadful arcade game. The idea is to cross the pond before



your rival does. So far, so good, but the plot soon takes a nosedive, as credibility is stretched to limits previously unsurpassed in the annals of computer games.

To start with, you don't actually get to play Richard or his rival. You take on the part of an eagle. Your task is to defend your own balloon while also trying to create maximum trouble for your opponent (either human or computer). You are not just an ordinary eagle though. You do have a sonic beam capability and must use this to the best of your ability to defend yourself against incoming missiles and planes.

I will give the odds of 1000 to 1 that you cannot guess how the planes will try to destroy your balloon. Give up? They drop paint on you. I suppose on reflection, this is not a bad idea. Defences against the heat seeking missiles are straightforward but you name me one airforce that can defend itself against a paint attack.

While all this is going on, you must also try to catch any passing boys who happen to be holding on to a bunch of balloons. You may have assumed that the main balloon is incidental to all this, but you must still try to navigate it as best you can by altering its direction and height. These are controlled by a series of icon situated at the right of the screen.

This method does not work particularly well with the wraparound system of movement used. Your eagle is too sluggish to give you proper control (the penalties of sonic beam perhaps?) A fourth icon allows you to pass into your opponent's half of the split screen display but in practice, you don't have the time to bother. Gameplay is reduced to the level of farce.

There is an old joke that says that there will be no money left in the world by the year 2000 because Richard Branson will have it all. Don't add to his cause by buying this rubbish.

G.R.H.

Touchline:

Name: *Transatlantic Balloon Challenge: The Game.* ***Supplier:*** *Virgin Games.* ***Tel:*** *01-727 8070.* ***Machine:*** *C64.* ***Price:*** *£7.95.* ***Originality:*** *3/10.* ***Playability:*** *2/10.* ***Graphics:*** *4/10.* ***Value:*** *2/10.*

Byting Into The 6510

Ever heard of 'indirect indexed addressing'? In this article on machine code programming we will discover all about it, and fill the whole screen.

By Burghard-Henry Lehmann

Programming in machine code (or assembler, which is what we really use) can be rough going, not because there are many difficult concepts involved but because it lacks the 'user-friendliness' we take for granted when writing programs with a higher level language like BASIC. A microprocessor like the 6510 does not itself contain any 'safety-nets' for the incautious programmer because 'safety-nets' take up valuable chip space and time to implement.

Furthermore the microprocessor is the computer in its naked, elementary, no nonsense form. Microprocessors have been developed with all sorts of things in mind, not just home computers like the Commodore 64, but also washing machines, stereo amplifiers, pocket calculators, and so on. In order to be so versatile they are essentially extremely simple devices.

A chip like the 6510 has roughly the arithmetical capabilities of a seven year old child who has just learned how to add and subtract simple numbers on his fingers. This simple-mindedness is offset by its abilities to do the few things it can do with breathtaking speed — at around half a million instructions per second — and, when programmed correctly, do everything with amazing accuracy.

So the task of the machine code programmer is a bit similar to that of a first-form primary teacher whose job it is to give a class of youngsters their first timid steps into elementary arithmetic. The simpler the steps, the better!

Programming in machine code means doing an awful lot with precious little to start with. And this is where the real challenge lies.

Task 3

With this in mind, let us return to the practical programming theme with which we started off in the last two articles. All the time we have been up against one of the major limitations of the 6510: the fact that all the programmable registers of the 6510 can only hold numbers in the range of 0 to 255.

In the first article, this was no problem because all we did was output a number to the first location of the screen memory — 1024. This is called *absolute addressing* and is very straight forward indeed.

In the last article we output a byte to a series of successive locations. For that we introduced *indexed addressing* which allowed us to fill 256 locations of the screen.

And there we had to stop, not just because the editor wouldn't allow me to fill one whole issue of *Your Commodore*, but because we came right up against the most obvious limitation of the 6510, the fact that neither the X-register nor the Y-register can hold more than 255.

In this article we want to go the whole hog and fill the Commodore screen. But the whole Commodore screen holds 1000 bytes — way beyond the limit of any of the 6510 registers.

So what can we do?

There is, of course, a way of doing it and this is called *indirect addressing*.

Indirect Addressing

This sounds like an undercover operation or something a mathematician does to his salad, doesn't it? But it is based on a very simple idea: use one location to point at another location.

Look at it like this: you are in a strange city and have to ask somebody where the railway station is. Maybe you ask a policeman. If you are a long way away from the station the friendly bobby might give you a whole string of directions, "Turn left and then right and then left again . . ."

Maybe our policeman is not only

helpful but also a bit of a psychologist. He realises that there is a limit to the number of left turns and right turns which anybody can memorize. So he says: "Go to such and such a street and then ask another policeman." In other words, the policeman is pointing you to a location where another policeman will direct you to your final location.

This is precisely what happens in indirect addressing: we want to output a byte, let's say, to the beginning of screen memory, which is 1024. But instead of giving this location directly to the microprocessor, we give it indirectly, that is, we load 1024 into one location and then we point the 6510 at that location, which we might call the *pointer-location*. In other words, we tell the microprocessor the location, where it can find the location, where it can get the data from (or output the data to).

At this point, dear reader, you are permitted a gasp of sheer incomprehension: even though you will doubtless understand the above concept, you will ask, "Why the heck would anybody want to do a complicated thing like that?"

But the whole point of indirect addressing is that it overcomes the major limitation of an 8-bit microprocessor. Since we are using one location to point at another location, this pointer location can be made to point at any location in the computer.

The reason why the novice in machine code programming seems to build up a kind of mental barrier against the concept of indirect addressing lies in the fact that it seems to be so unnecessarily complicated. Why not use absolute addressing and add any number to that? But this is precisely what the 6510 can't do. By putting the address of a location into another location we making it into a number like any other number. And that the 6510 can deal with, or, more correctly, you can write a program which will do the job. As we will find out later, there are instructions which allow you to add and subtract numbers of practically any size. But the 6510 does not allow you do do that directly to the address of a location. You first have to make it into a number like any other number. And this is what indirect addressing is really all about.

Suppose I put 1024 — the beginning of screen memory — into the pointer location, so it is now pointing at 1024. I want to move 500 bytes up, which is of course way over the limit of any 8-bit register, so I add 500 to 1024, giving 1524. Now the pointer location will point at 1524, which is exactly what I want. And if I add one to that, it will point at the next location, namely 1525 and so on.

This system gives me access to the whole memory range of the computer, from location 0 to location 65535, something I just couldn't have obtained with either absolute or indexed addressing.

The basic obstacle when programming in machine code is that there are more things you can't do than things you can. So you have to get used to inventing ways of doing what you basically can't do, with the few things you can do. It's a bit like building Westminster Cathedral out of matchsticks or constructing a vacuum cleaner with a Meccano set!

Index — Y

There are odd moments in 6510 machine code programming when there are actually some attempts made to make life easier for the programmer! Indirect addressing is, as you might imagine, one of the most often used instructions of the 6510 and the considerate engineers who designed the thing have added an indexing facility to it.

Above I explained that we can make the pointer location point to any location in the computer by adding or subtracting any number to it. But since we have to do this in the form of a program with extra instructions, it can also be pretty cumbersome. Imagine what would happen every time we wanted to fill successive locations! We would have to add one to our pointer location with every pass through our loop, which would waste an enormous amount of time and memory.

So indirect addressing is indexed with the help of the Y-register. This means that we have to add or subtract only ever 256 bytes. Within 256 bytes — or a *page*, as it is also called — we can index in exactly the same way as we did in the last article.

But there are a couple of rules to indirect indexed addressing (aren't there always!) The pointer location has to be a location in zero page, that is, it has to be between location 0 and 255 in the computer. As a trade-off for this limitation we get the advantage that the whole instruction uses only two bytes.

And, secondly, unlike indexed addressing the uses of the X-register and the Y-register are not identical. If you use Y, then the contents of the Y-register are added to the contents of the pointer location. But if you use X, the contents of the X-register are added to the pointer location itself and not to the contents of it.

Since, as I can tell you from experience, indirect-X addressing is used very little, you might as well forget all about it for the time being. (As a matter of fact, indirect-X isn't used once in the whole of the Commodore ROM, and I am still looking for a machine code routine which uses it . . .)

On the other hand, indirect-Y is used constantly in 6510 machine code programming, so you had better fix the principles of it firmly in your mind: a location in zero-page is loaded with the address of the location where the data is to be found and the Y-register is used to index 256 bytes of the contents of the pointer location.

And to close the "theory" section of this article: in assembly language indirect indexed addressing is conventionally expressed by putting the address of the zero page location into round brackets and then a comma and then the Y afterwards, e.g. :"(251,),Y" or, if you use a label "(LABEL),Y". And, if you should ever use it, indirect-X is expressed like this: "(251,X)" or "(LABEL.X)".

Back to Work

After all this dry theory, let us now return to our programming task and see how we can use all this in practice.

Listing 1 gives you the assembly listing of a program which will fill the whole of the Commodore Screen.

Zero Page

In lines 90-170 I initiate the pointer-locations in zero page which will be needed for indirect indexed addressing.

In 6510 machine code programming zero page has special relevance. Since the 6510 has only three programmable registers (A,X and Y), there is no room to store data even temporarily inside the microprocessor. The 6510 makes up for this lack of registers by using the locations in zero page as what one might call pseudo-registers. That is, you may see zero page as a kind of

extension of the 6510. For this purpose all instructions concerning zero page can be given without the high byte of the location: if it is zero page, it's included in the instruction and the 6510 will know that it is zero page. This saves you one byte.

Secondly, all zero page instructions take less time to execute. So, if you want maximum speed of execution use zero page whenever you can!

Thirdly, as we have already found out, when you want to use indirect indexed addressing you have to use locations in zero page as pointer locations!

But you have to be aware that both the BASIC interpreter and the Kernal use zero page locations for their main system variables. Some of these variables are vital for the proper functioning of the Commodore 64. For example, if you wrote unwittingly into location 1, you might switch the whole of the BASIC interpreter and the Kernal off so that, when you want to return to BASIC, there will be no BASIC to return to! This, of course, will result in a massive crash, because you will be unable to communicate with the computer any more!

Other zero page locations you can use quite happily: locations decimal 251-255 are completely safe because they aren't used at all by the operating system. If you use a disc-drive you've got a whole number of zero page locations which are only used for tape-operations (146, 150, 155, 156, 158, 159, 166-179). I also use locations 73-128 quite a lot. They are all right, as long as you don't use the floating point calculator of the C64 and don't intermix BASIC with machine code.

Low Byte/High Byte

In line 90 I do something which, on the face of it, I shouldn't be able to do at all: using immediate addressing (prefixed with " # ") I load 1024, which is of course a 16-bit number, into the A-register! How can I do such a thing when I have said, over and over again, that none of the registers of the 6510 can hold numbers greater than 255?

Well, notice the "<"-sign before "1024". This has special relevance here! With it I tell the assembler not to load the whole of 1024 into the accumulator, which would surely give me an overflow, but only the low byte of 1024, which is 1024-[(1024/256-)*256]= 0.

Then I load this low byte into the first of the zero page locations I have chosen: 251. In machine code 16-bit numbers are always written into memory with the low byte first and the high byte following after that.

The low byte of a 16-bit number is of course the remainder you get when you divide the number by 256. The number of times you can divide the number by 256 is the high byte.

In line 110, I instruct the assembler to calculate the high byte of 1024 by putting ">" in front of 1024 — and, again, load it into the accumulator. The high byte of 1024 is 1024/256=4. Therefore, 4 goes into the accumulator, and from there it is transferred into the second zero page location (in our case decimal 252).

Now zero page locations 251 and 252 are pointing at the beginning of the Commodore screen memory. In other words, zero page location 251 holds the low byte of 1024 (=0) and zero page location 252 holds the high byte of 1024 (=4).

In lines 140-170 I do the same thing with the beginning of the colour memory. This finishes the initializing part of our program. Now we can begin the action, starting from line 210.

Since we have to fill 1000 bytes and can index up to 256 bytes every time, the obvious way to do the job is in four goes. This will of course result in an additional 24 bytes being written into since 256*4=1024. But in this case we can be quite casual about this. Nothing vital will be overwritten by those 24 bytes.

At other times you have to be more cautious and do the job exactly right. On the whole, stick to the rule: always be aware that strange things can happen if you write unwittingly into certain locations!

In line 210 I set up the variable which I use as the counter of the four blocks. I use the X-register for that, because in this routine I won't need it for anything else. Furthermore I count downwards as they do at Cape Kennedy. This saves me an extra instruction, because when the count reaches 0 in line 380, the zero-flag will be set and the 6510 will leave the loop and exit.

Next I zero the Y-register (line 220), which does the main character count. With every pass through PRINTLOOP (lines 230-280) the Y-register is incremented by one and this is added to the location contained in the zero page locations 251 and 252 and 253 and 254 respectively.

If, like me, you aren't a mathematical genius and an ace in abstract thinking, I advise you to get the workings of this firmly fixed in your mind by playing it several times through in exactly the same way as the microprocessor does it.

We start off with 1024 and the Y-register contains 0. So when it comes to line 240 the microprocessor gets the value 1024 from zero page location 251/252 and adds the contents of the Y-register to it. Therefore the output location is 1024+0=1024. This is where the contents of the A-register (in our case 1) is written to.

In line 270 the Y-register — or index — is incremented by one. And since this will clear the zero-flag, it will branch back to line 230, the beginning of "PRINTLOOP".

Now the contents of the Y-register is 1, and this is added again to 1024, giving 1025, which of course is the next position of the Commodore screen.

And so it goes on, filling the first 256 positions of the screen. Since the Y-register can't hold more that 256, it will eventually notch back to zero. This will result in the zero-flag being set and the 6510 exiting from "PRINTLOOP".

Lines 320 and 330, which it will execute next, are crucial to the whole working of indirect indexed addressing, because this is where we overcome the limit with which we were presented in the last article! And notice, how simple it really is: all we have to do in our routine is increment the high byte of our output addresses by one! (Unfortunately it is not always that simple. Very often it is necessary to update the indirect address in an uneven way. In this case you have to use addition (or subtraction), which in 6510 machine code programming is not as straightforward as one would like it to be. But more about this at a later date!)

"INC" is a very simple 6510 instruction which tells the microprocessor to increment the contents of a location by one. It's similar to "INX" and "INY", which we already know about. But what you must be quite clear about here is that the contents of a location is incremented, and not the location itself! This kind of confusion gives the

beginner in machine code programming an endless amount of trouble.

Since we are dealing here with the high byte of 1024 the location we are incrementing contains 4. So it is incremented to 5, and this gives us 5*256=1280, which is the base of the next block of screen memory we want to fill.

Line 330, of course, does the same thing for the colour memory.

Since the Y-register has automatically been reset to zero, we can, after having decremented the main counter, jump straight back to "PRINTLOOP" and fill the next 256 bytes of the screen.

Waiting for a Break

In order to make our program more user-friendly, I have added a little routine at the end which makes it wait for the RUN/STOP-key to be pressed. Without this you would get the Commodore 'Ready' message and cursor printed straight away before you had any time to admire the full page you had printed in machine code.

This is a loop which loads the contents of the system variable 145 into the A-register and tests it against decimal 127. "CMP" stands for compare with accumulator.

If location 145 contains any number but 127, this means that the RUN/STOP key hasn't been pressed. In this case the zero-flag will be cleared and it will jump back to the beginning of the loop in line 420.

If, on the other hand, location 145 contains 127, then that means that the RUN/STOP-key has been pressed.

Now it will compare with the number given after the "CMP" instruction, the zero-flag will be set and the microprocessor will jump to the exit in line 480.

```
Listing 1
---------
10            ORG 49152
20 ;
30 SCREENMEM EQU 251
40 COLOURMEM EQU 253
50 ;
60 ;
70 ;INITIATE POINTER LOCATIONS FOR INDIRECT ADDRESSING
80 ;
90            LDA #<1024
100           STA <SCREENMEM
110           LDA #>1024
120           STA >SCREENMEM
130 ;
140           LDA #<55296
150           STA <COLOURMEM
160           LDA #>55296
170           STA >COLOURMEM
180 ;
190 ;FILL SCREEN IN 4 BLOCKS
200 ;
210           LDX #4          ;COUNTER OF BLOCKS
220           LDY #0          ;COUNTER OF CHARACTERS
230 PRINTLOOP LDA #1          ;LETTER "A"
240           STA (SCREENMEM),Y
250           LDA #6          ;COLOUR BLUE
260           STA (COLOURMEM),Y
270           INY             ;INCREMENT INDEX
280           BNE PRINTLOOP
290 ;
300 ;UPDATE HIGH BYTES OF POINTER ADDRESSES
310 ;
320           INC >SCREENMEM
330           INC >COLOURMEM
340 ;
350 ;DECREMENT BLOCK-COUNTER AND LOOP BACK IF NOT ZERO
360 ;
370           DEX
380           BNE PRINTLOOP
390 ;
400 ;WAIT FOR RUN/STOP-KEY
410 ;
420 BREAKKEY  LDA 145
430           CMP #127
440           BNE BREAKKEY
450 ;
460 ;AND, WHEN PRESSED, RETURN TO BASIC
470 ;
480           RTS
```

The Toy Shop

Here's a chance to make a selection of toy models with your computer, thanks to Broderbund's new package.

By S. Garton

The idea of the whole program is to select the model you want to make, set it up, and then print it onto normal printer paper. That is then the computer's job over. It is now up to you and your creative abilities to produce an accurate model. Not only are these models nice to look at but they are also working models. Some of them are just made from the paper, but for the more sturdy models you stick the paper to the card before cutting it out.

A very extensive manual is included in the package, along with three disks, adhesive-backed card, wooden dowels pieces of wire, rubber stripping, cotton cord and balloons. The manual has easy instructions for using the program and then a detailed construction guide for each model. All you need to supply is the computer, a printer and some glue and paper clips. (The package gives a list of the printers that can be used.)



Design your own

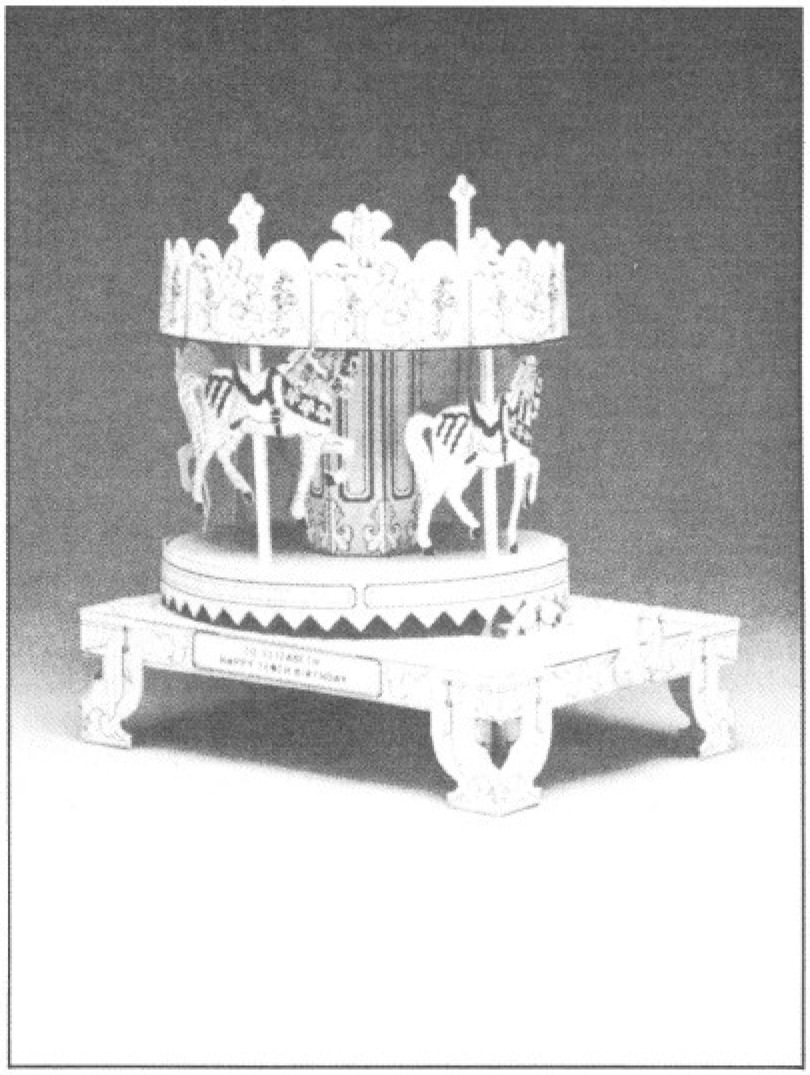
The selection of drawings and modifications is carried out with easy-to-use menus. It you have quite a creative mind you may not be happy just doing the set models, so for you there is a chance to customize and adapt the models. So though there are only plans for 20 models there are hundreds of possible variations. You can add personalised text, change fonts and type style and alter print patterns.

There is an option in the program to browse through the whole selection of toys and models. You will be shown a detailed picture and description of each one, and using this you can decide which model you would like to make, find out how easy or difficult it will be and what materials you will need. If you know beforehand what you would like to make, you can go straight to an alphabetical list and select it from there.

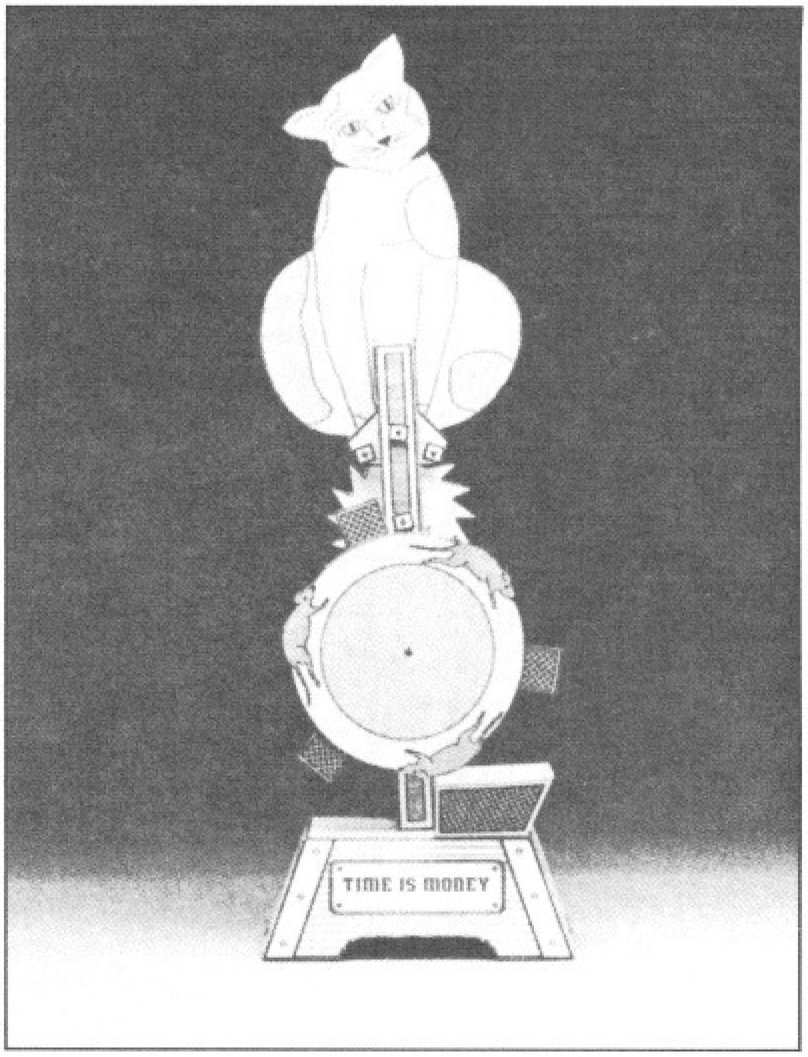
Having made your selection you can then either print, customize or load your choice. The load option allows you to re-use your own customized model which you previously saved on disk. There are nearly 40 print patterns for you or if you are another Picasso you may even want to create your own print patterns from scratch. (Rather you than me.) These you can then save on a separate disk to be used again. After all, why waste your creativeness!

Once you are happy with the look of the model you can select 'print' from the menu. You can print up to nine copies at any one time, and you can also select certain pages from each model to print out rather than the whole thing. This is especially useful if you spoil or loose one sheet. To find out which specific sheet you need, there is an index at the back of the manual showing a full layout of each sheet.

The printout times are probably longer than you are used to. They range from about eight minutes for the simpler models, to about 20 minutes for the more detailed ones.



Above: Carousell.
Below: Mechanical Bank.



Putting them together

The second part of the manual, the construction guide, gives detailed instructions on how to put each model together and provides a photograph of each one, so you can compare your end result with what it should look like! The models range from easy, medium and challenging so if you are a bit clumsy, like me you might be as well to start at the beginning. As already mentioned some of the models need to be made from the card. It will say on each sheet whether this is necessary or not. Should you run out of card, more is available in a refill pack.

Alternatively you can use ordinary card and spray adhesive. When you have printed out the pieces you can colour them before assembling them, with either coloured pencils, water colours, oil paints or felt pens. An alternative is to print the models on coloured printer paper.

Fun can be had by all

You may think all this sound like Blue Peter, with their sticky-back plastic, but believe me it's great fun. I'm not very artistic but I had a great time producing these models. You have to be patient as some of them are complicated and if rushed will not look very good. It is great fun for adults and children alike and will provide hours of entertainment! The package is quite expensive at around £40 but having looked at it I think this is reasonable, especially if it keeps the kids or husbands quiet!

Touchline:
Name: *The Toy Shop.* ***Supplier:*** *Precision Software.* ***Tel:*** *01-330 7166.* ***Machine:*** *C64.* ***Price:*** *£39.08 (+£1.40 p/p).*

CP/M and the Commodore 128

Batch processing and assembly language are both possible in CP/M – but you have to know how.

By Mycroft Appleby

The *submit transient* command is at least as powerful as the PIP command. What it allows you to do is to make up several CP/M commands into a sequence of instructions. The most common use is to start off a complex program where a number of terminal options need to be set, or other system changes made.

The command takes the form SUBMIT name.SUB; this will read the file 'name' and execute the commands in it as if they were entered in at the keyboard. The difference between this and the GET command is that SUBMIT is much more powerful, particularly in its parameter passing and actual operation of programs.

The object file containing the commands is usually entered using ED, as discussed last month. It's usual to end its name with .SUB, the file extension which tells the SUBMIT command that this is a SUB file. An example of a SUB file (which we'll call WS.SUB) might take the form:

```
ERA file.BAK
REN file.BAK file.TXT
B:
WS
```

Typing SUBMIT WS.SUB would rename a commonly used text file, set the default drive to B: and start up a word processor — nothing complex in that. GET could have done the same, and probably faster.

Suppose, in the same example, we didn't know the name of the file that we wanted to back-up: we would need to use the parameter-passing option. Parameters are typed in after the SUBMIT command SUB filename. Up to nine parameters may be passed and they are referred to by the names $1, $2, etc, to $9, $1 being the first parameter in the list and $9 being the ninth.

If the example file above is changed to the following:

```
ERA $1.BAK
REN $1.BAK $1.TXT
B:
WS
```

it will deal with any text tiles. Now typing SUBMIT WS.SUB file will perform the same function as above, but SUBMIT WS.SUB fred will perform the same function but with the name fred instead of file.

The astute reader will have spotted that this method makes it rather difficult to use dollar signs normally when you don't want to use variables. This is overcome in CP/M by typing two dollar signs, $$, which will get replaced by a single dollar, $, when the time comes.

If you wish to direct control of an actual program, a slightly different method must be used. Take the following example:

```
PIP
<A:=B:*.*
<
DIR
```

This, as a SUB file will enter PIP and copy the contents of one drive over to another. The less than sign, <, must precede all in-program commands. A< on its own is taken as a carriage return.

The SUBMIT command is a form of RSX as discussed in an earlier installment. SUBMIT commands, as well as the cruder GET commands can be nested so that they call each other, but eventually you run out of memory.

There is a special SUBMIT file which must be called PROFILE.SUB. This SUB file is called when CP/M+ first starts up, this can be used to personalise your system.

Programming In CP/M

CP/M was originally designed to make the programming of the Intel 8080 microprocessor slightly easier than typing in hex codes.

CP/M provides all the routines necessary for all the basic computing functions or *primatives* as well as some fairly complex disk handling and some crude editing facilities.

To program in CP/M you need to know two things — how CP/M operates, and how to program in 8080 or Z80 code.

CP/M is similar to many other operating systems in the way that it performs tasks: first the user sets up various parameters, calls the appropriate routine, and then the OS carries out the task; the OS returns to the user either with the results of the task or some helpful (one hopes) information about why the task wasn't completed successfully.

The C64 operating system works along these lines: you set up registers, and then call an address where the routine is stored or where there is a jump to where the routine is stored. You have to keep track of all the locations of the routines and addresses.

The BBC micro (which is very similar to the C64 in hardware terms) uses a different system; the OS keeps its own table of where the routines are stored, and can keep track of changes in the memory map. As a result, you make the same call whatever changes may have been made to the memory map, and the OS does not have to be altered to take account.

Because CP/M was designed from the start to be used on different systems with different configurations, it uses the same method as the BBC (or rather, the other way round).

The actual operating part of CP/M is held at the high end of memory, but the first &100H bytes of memory are reserved by the system. One of these is the place to call for your OS function — &0005H actually.

The C register is located with the number referred to the function that you want to perform. A, D, and E, are loaded with data, then 'CALL &0005H' is all you need to perform it. The A register then returns with the success status of the instruction.

When CP/M first came out with V1.4, it had 27 instructions. V2.2 had just under 40, whilst CP/M+ (V3.0) that we are using has about a hundred. This isn't the biggest CP/M version though: MP/M II - the multi-user version of CP/M — has around 150 commands available!

As an example, consider the most simple OS command in any operating system — outputting a character to the screen. A quick glance at our CP/M programming manual reveals that the code for this is &02H, and the character to be output must be held in the E register. The code for this could look like this:

```
LD E,&21H
LD C,&02H
CALL &0005H
```

This would print an '!' on the screen taking into account scrolling and pauses from the keyboard.

A slightly more complicated function would be to print a string on the screen. This has &09H as its code:

```
code LD DE,txt
     LD C,&09H
     CALL &0005H
```

In this case the D and E registers are treated as one 16-bit register and contain the 16-bit address for the start of the string. The $ sign indicates the end of the text string. C, as usual, holds the CP/M function code. However to print a dollar sign on screen you need to use function 02 as above (nothing is ever easy in CP/M!).

C for Control

As with any system, there are assemblers and monitors to help you program in mnemonics and to test your results. However with the standard CP/M utilises MAC, ASM, SID, DDT and the like there is a small problem. They all work with 8080 code rather than with Z80. There is no great problem with this. You will just have to learn 8080 mnemonics rather than Z80 ones. It all produces the same code in the end whether you use 'MOV A,C'A OR 'LD C,A'.

MAC,RMAC, and ASM all work in much the same way. A file is created with ED and the program is invoked, assembling the program into a .HEX file which can then be converted into a program that CP/M can run. But it all has to be in 8080 code. You will do much better if you buy, or obtain via public domain, a 'real' Z80 assembler.

SID is the 'symbolic instruction debugger' and replaces the earlier DDT or 'dynamic debugging tool' which was used on earlier versions of CP/M and will not be discussed here. There is also a ZSID that uses Z80 codes rather than 8080 codes and is much more useful.

Like TIM, the Commodore monitor (and almost every other monitor in existence), commands are entered in with one letter and some data. The table shows a list of commands - most of them will be familiar to Commodore users.

An	Enter single line assembler, n is the start address
Cn bc,de	Call address n . bc,de optionally load these registers
D W n1,n2	Display hex between n1 and n2. W optionally displays as words
Fn1,n2,d	Fill n1 to n2 with d
G n,b1,b2	Go at n with optional breakpoints at b1 and b2
ICOMM	Enters CP/M command COMM
L n1,n2	List (disassemble) 8080 instructions between n1 and n2
M n1,n2,n3	Move n1 to n2 to start at n3
Rfile	Reads file into memory
T W n2,n1	Traces program at n1 through n2 instructions and optionally (W) without tracing CALLs
U W n2,n1	Untrace as above
Wfile,n1,n2	Writes file between memory addresses n1 and n2
X f/r	Examines the flags or register state

There are a few more complex commands, but they require a full explanation of MAC the 8080 macro assembler and its symbol handling, and it's not worth it for 8080 code. The commands in ZSID are basically the same but use Z80 mnemonics.

I hope you've enjoyed this short series on the 'hidden' side of the C128 and CP/M in general. With the advent of the Amstrad range of CP/M based machines, CP/M has received a new lease of life and many programs are now being re-released, as well as lots of books being re-published.

If you have any problems or queries with CP/M, then don't hesitate to write in. Unfortunately we cannot answer problems personally, but in a few months we will run a couple of pages with the most common queries and answers.

CP/M is a fine operating system if put to the use it was intended for — Z80 and 8080 development systems. Use it wisely and it will be your friend. Put it under too much strain and it will bite back!

Bibliography

CP/M 80 Programmer's Guide (Macmillan) One of the more detailed programming guides for CP/M. Deals with writing your own programs rather than using the system.

Digital Research CP/M Plus Handbook (Heinemann) 477 pages of everything you want to know about CP/M+. Not so heavy on the programming, but lists all the commands and functions in great detail. Now available from Amstrad in a new edition.

Z80 Reference Guide (Melbourne House) The ultimate Z80 book. All you need to know to get the best out of your C128 (394 pages).

Speedy Assembler

Get into machine code programming the easy way with our special offer.

The Commodore 64 computer is a programmer's machine, but most of its outstanding facilities, like high-resolution graphics and three voice sound production, are not easily accessible from Basic. Sooner or later you may have to think seriously about getting into machine code programming, even if you only want to write some subroutines in machine code to spruce up your Basic programs.

In order to introduce its readers to the mysteries of machine code programming Your Commodore has recently started a major series on machine code programming, called 'Byting Into the 6510'. The author of the series, Burghard-Henry Lehmann, has spent many months writing a comprehensive machine code development package, called 'Speedy Assembler'. Now 'Your Commodore' is offering this program to its readers at a special price.

```
10                ORG 49152
20      ;
30      SCREENMEM EQU 1024
40      COLOURMEM EQU 55296
50      ;
60                JSR $E544
70      ;
80                LDX #0
90      PRINTLOOP LDA #1
100               STA SCREENMEM,X
110               LDA #6
120               STA COLOURMEM,X
130               INX
140               BNE PRINTLOOP
150     ;
160               RTS
```

Sample text file

A Brand New Operating System

Speedy Assembler is a 100% memory-resident program. Load it in either from disk or tape, and you've got a whole new operating system at your fingertips, consisting of a comprehensive screen-editor, fast two-pass assembler and monitor.

With all this help you will find that writing assembly listings can be surprisingly easy and, in some respects, even more convenient than writing Basic programs. This is especially true if you compare what Speedy Assembler has to offer with the rather poor operating system of the Commodore 64, which has next to no tool-kit routines.

Here are some of the facilities the screen-editor of the program offers you:
auto line numbering.
block-copying of lines.
block-deletion of lines.
line renumbering facility.
search facility.
temporary listing interrupts.
automatic listing interrupts.
scrolling the screen down from the top.
converting numbers from hex or binary into decimal and vice versa.
doing calculations with numbers in different bases.

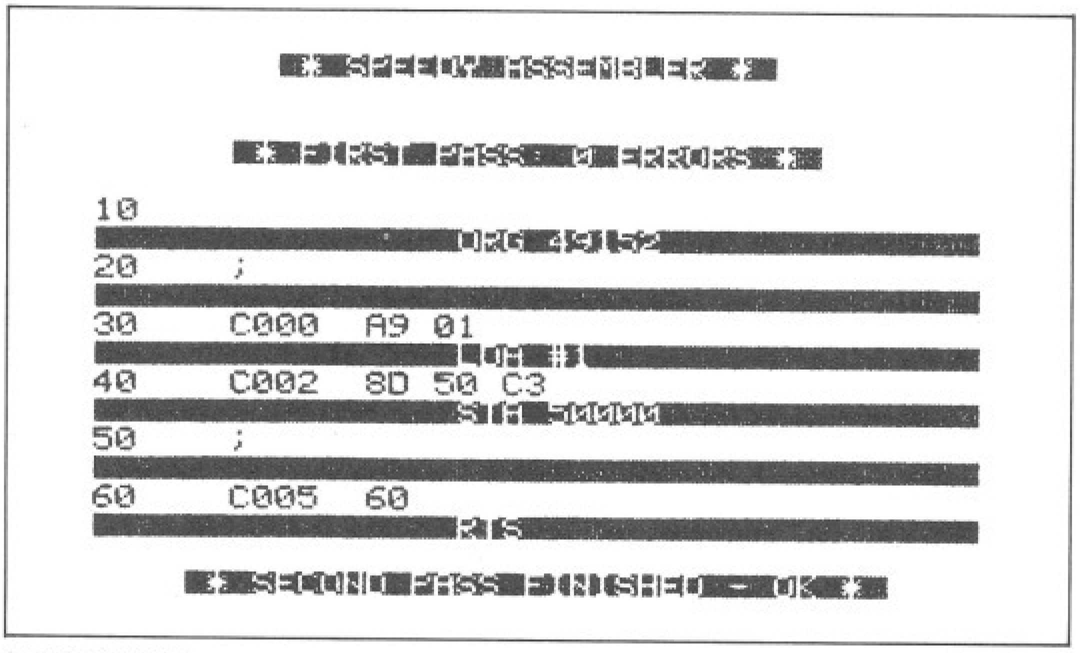
All these facilities allow you to enter and manipulate assembly listings in the most convenient way possible.

Printing It Out

Afterwards you can get a print-out of all the listings produced by Speedy Assembler. This is simplicity in itself - just enter 'P', and every listing- be it the listing of a source file, an assembler listing or a symbol table listing - that is produced by the next command you give will be sent to the printer instead of the screen.

Speedy Assembler even includes a screen-dump facility which is useful if you want to design your own headings and subtitles for any of the listings.

Part of the user-friendliness of the



Sample assembly

program is the comprehensive error-checking system it employs. This warns you of minor hiccups before they become major calamities.

Speedy Assembler gives 'intelligent' error reports, that is, there are 26 error messages which tell you clearly and concisely which error has arisen. Most error reports are given immediately after a faulty line has been entered, and this will result in the line not being placed in the source file. This immediate error-checking system speeds up assembly and prevents those seemingly endless lists of error reports which you might otherwise get after the first pass.

Futhermore, if you give a wrong command to the screen editor of Speedy Assembler, there will be an arrow pointing to the incorrect letter or parameter.

All this permits you to use the program right from Day One without having constantly to worry that something might go lethally wrong!

The Assembler

Once you've used the screen editor to create an assembly listing, or source file, as it is also called, you can assemble it into machine code straight away. Since the whole program is memory-based you do not have to waste time loading a separate assembler module into the computer.

The assembler produces the machine code you want in a matter of seconds, ready to be executed and tested.

There are five options the assembler gives you: You can have an assembler listing or, if you prefer maximum speed, not. Furthermore you can have the listing in hex or decimal.

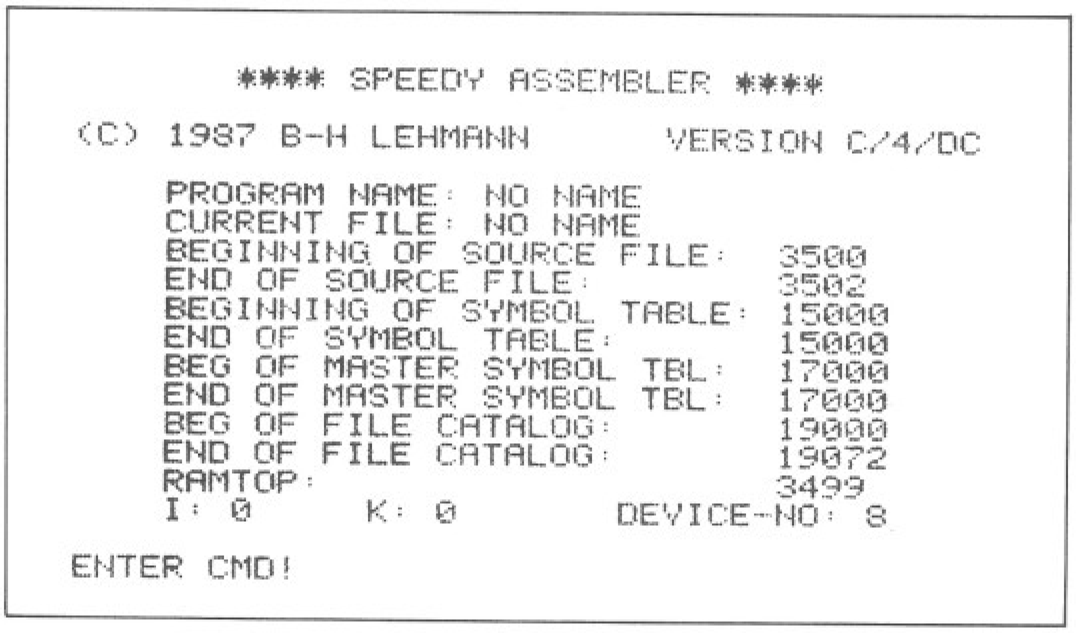
An important option gives you an assembler listing (either in hex or decimal) but does not produce any object code. There are times where this option comes in very handy. This is when you want to see how a particular source file assembles but don't want the object code to be written into memory because it might overwrite something else.

The whole idea of the program is that you can develop your machine code with a minimum of fuss and without having constantly to save and load. And since 'Speedy Assembler' is so fast, you don't have to dread every time you want to re-assemble a routine after you have modified it!

But there is even more to the package we are offering you:

Speedy Assembler includes two powerful capabilities - a master symbol table and a file catalogue facility - which no assembler we know of has got. These two options have been designed to assist the experienced machine code programmer who wants to write larger programs, like arcade games, word processors, major utilities and so on.

Information Provided



The Master Symbol Table

The master symbol table is a second symbol table which allows a linkage between different source files. Unlike the ordinary symbol table it is not built up automatically. Instead you can decide with the help of a simple transfer facility which labels you want to keep in the master symbol table. Once a label is in the master symbol table the assembler takes it into account just like any other.

This allows you to declare the main variables used in your program once only, and all subsequent source files will be assembled without any problems.

The master symbol table is also very useful for jump vector table and subroutine calls.

The Filecatalog

The second advanced facility of 'Speedy Assembler' is the file catalog. This is a list of all the source files you have designed so far, each entry giving you the filename and beginning and end addresses of the object code of that particular source file. In this way you get a complete record of the program

you are writing which is constantly updated by the computer. At a glance you can tell how much code you can add to a certain source file before the adjacent object code is in danger of being overwritten.

And because of the file catalog the assembler is even able to give you a warning error report if this should happen!

Maximum Flexibility

Another aim of 'Speedy Assembler' is to give as much flexibility in memory management as possible.

Memory management is of vital importance when it comes to machine code programming, because unlike Basic you have to plan how to make the best use of available memory, especially if you are writing a large, self-contained machine code program. And as things go, however well you plan your memory layout, in the end things never quite work out as planned.

This is where the flexibility of Speedy Assembler comes in: the beginnings and endings of the source file, the symbol table, the master symbol table and the file catalogue are made visible to you and you can block-move any of these files at any times to a more suitable position. So if you have to switch things around you can do it with a minimum of fuss.

In addition to this all the above files are constantly checked to see if any of them is in danger of overwriting another file or the program itself. And before this can happen a warning is given.

User-friendliness saves you a lot of work in the long run!

Finally

There is much more we could tell you about this excellent machine code development package. But in the end there is no substitute for trying it out yourself. And at £9.95 per copy we'll be very surprised if you don't!

Buying the Software

This program is only available through *Your Commodore Readers Services* department. It cannot be ordered from *Your Commodore* office.

Orders should be sent to the address on the order form with a cheque or postal order for £9.95 made payable to A.S.P.

The package includes all necessary documentation as well as some examples of how to use the assembler in the form of assembler programmes from past issues of *Your Commodore*.

Tape or Disk

The Your Commodore Speedy Asssembler is available on both cassette and disk.

Through a simple POKE instruction the cassette version can be made to work with disk. You will of course not have all the facilities of the disk version available to you.

The Disk version of Speedy Assembler will NOT work with cassette.

ORDER FORM - PLEASE COMPLETE IN BLOCK CAPITALS

NAME	CODE	PRICE	NUMBER	TOTAL
SPEEDY ASSEMBLER (DISK)	YSPASSD	£9.95		
SPEEDY ASSEMBLER (TAPE)	YSPASSC	£9.95		
OVERSEAS POSTAGE		1.00		
			TOTAL	

I would like to order a copy of **Speedy Assembler** for the Commodore 64.

Name ....

Address ....

Postcode ....

I enclose a cheque/postal order for £. . . . . .made payable to ARGUS SPECIALIAST PUBLICATIONS LTD.

All orders should be sent to: YOUR COMMODORE, READERS SERVICES, ARGUS SPECIALIST PUBLICATIONS, 9 HALL ROAD, HEMEL HEMPSTEAD, HERTS HP2 7BH.
Please allow 28 days for delivery.

Smooth Vertical Scroller

Is your vertical scrolling just a little jerky? Type in this listing and you can stop buying the aspirins.

By Suman Roy

There must be many users who have video recorders, and would like to use their 64 or 128 to create video titles for home productions, etc. One way is to use the standard size Commodore text, but this tends to look insignificant on a video title screen.

With this program, you can create titles that appear in double size characters (twice the height *and* width of standard text) with the addition of smooth vertical scrolling. Even if you don't have a video recorder, the program is great fun at parties (what sort of parties do you throw? — Ed.), and can be very useful at meetings.

The system is in two parts, the code boot and the editor/scroller.

These Boots

The code boot will read in the machine code and character data from the DATA statements, and enter them into memory. Type in the program as listed, and then **SAVE it immediately**. The code uses memory which overlaps with that used by the program, so it is initially relocated. However, when all the code is entered correctly, a prompt will be given to save the generated code. If you have not SAVED the code boot program yet, hit RUN STOP and RESTORE together and save it.

Press RETURN on seeing the prompt, and the code will be saved as a single file named "MC CODE" on disk. If you have a tape unit, or wish to change the filename, then alter line 100 to:

100SYS5782"FILENAME",
DEVICE,1

where DEVICE = 8 or 9 for disk users, and 1 for tape.

Now type in part 2, the editor/scroller and SAVE it before running it. You are now all set start composing your first title screen.

In Use

To use the system:

1. Load in the code generated by code boot e g: LOAD "MC CODE",8,1
2. Type NEW
3. Load the editor (Part 2), and run it.

The screen will go white, and a black square should appear in the upper left corner of the screen. This is your cursor. Messages may not be typed in, but only up to 16 characters may be entered per line. The cursor will not allow you to advance past column 16 of the screen.

After typing in each line, press RETURN. This is very important as each line is processed only after the RETURN key is pressed. This editor is a pseudo-screen editor, that is, it behaves rather like the screen editor you use to type in programs on the 64. However, only alphanumerics may be entered, and, only in upper case. In addition, the ".", and "-" keys may be used, not to mention spaces.

The cursor up/down keys do what you might expect, allowing you to type in messages down all 25 rows of the screen. Cursor right also functions as normal, but use the 'del' key to perform a cursor left. With a little practice, you will be able to enter messages quickly and efficiently.

This system can be used to produce hundreds of lines of titles in one go, and so I have allowed the screen to scroll both up and down to enter messages in the correct places.

One point to note is that the routine will automatically centre the text on screen when it comes to output the finished product, so do not preceed messages by leading spaces.

If you use the cursor keys to edit a message, remember to press return afterwards to reprocess the modified line. Before pressing return, though, move the cursor to the end of the line, as otherwise the character that the cursor is on and all characters afterwards on the same line will be deleted.

When you have entered your messages, you can view the title by pressing the asterisk key.

The screen will clear and you will receive a prompt for the speed of the scroll. By pressing the cursor down key, you can alter the speed setting, which is indicated on screen. There are two speeds, 1 and 2. 1 is the faster, 2 is half speed. Having made your choice, press return.

A prompt will appear for the foreground colour. As before, use the cursor down and return keys to make your choice.

Finally, there is the background colour to choose. Again use the cursor down and return keys.

Now the screen will clear, and after a few seconds the title will appear. This takes about three seconds at speed 1. and six at speed 2. The title will scroll smoothly up the screen, and when it is finished, press the space bar. This button can be used at any time while viewing the title. If the title does not appear after six seconds, press the space bar and re-roll the titles (occasionally, the titles will not appear, but this should fix it).

Pressing the space bar will take you to another menu where you can either re-roll the titles, i.e. view them again, or re-enter titles, i.e. return to the edit screen.

From the edit screen, pressing the left arrow key will take you to the input/output menu. Here you have several options:

save title data just typed in using the editor;

re-load such title data;

create a demo.

The first two options are self-explanatory. Create-demo will allow you to save your title in a form which can be reloaded in a single file, and run.

Whether you wish to load or save data, or to create a demo, you will be asked to identify the type of storage device you will be using, disk or tape. The options will appear, and again, cursor down and return keys are used to make the choice.

The system will allow for tape units as well as disk drives of device 8 or 9.

The filename is required next. To avoid errors for disk users, the program must have a filename before proceeding. Only alphanumeric characters are valid, and only up to 11 characters.

Finally, instructions will appear for your option to set the storage device and press return.

Note, however, that if you create a demo, you should load it back with a secondary address of zero; so for example, you should type in:

LOAD"FILENAME",8 (for disk)
or
LOAD"FILENAME" (for tape)
You should **not** type in:
LOAD"FILENAME",8,1
or
LOAD"FILENAME",1,1
as the demo will not run like this. Nothing else is required for the demo to run, so the scrolling system does not have to be loaded first.

With both the save title and create demo routines not quite the whole area of text memory available is stored. Text will be stored *only* up to the last line before the line with the cursor on it. By this I am referring to the lines for text entry on the edit screen. So, if the cursor is on line 3 of the text edit screen, then on calling up the save or demo routines, only lines 1 and 2 are saved. This is to avoid saving unnecessary memory, and to thus reduce loading and saving times.

The demo will, upon running, scroll the title at the same speed and colours it was saved with, and to stop scrolling it, use the space bar. It can then be re-run to play again etc.

As before, if the title does not appear after six seconds, press the space bar and re-run the demo.

PROGRAM: CODE BOOT

Please use the SYNTAX CHECKER program when typing in this listing.

```
BF   10 M=8192:R=0:L=360:GOSUB260
45   20 M=12296:R=0:L=1550:GOSUB2
     60
CF   30 M=12544:R=0:L=1840:GOSUB2
     60
2B   40 M=12808:R=0:L=2110:GOSUB2
     60
2A   50 L=2380:R=0:M=13320:GOSUB2
     60
3B   60 L=2670:R=0:M=13568:GOSUB2
     60
BC   70 L=2940:R=0:M=13832:GOSUB2
     60
83   80 L=3210:R=0:M=33856:GOSUB2
     60
0D   85 L=3270:R=0:M=7937:GOSUB26
     0
89   91 PRINT:PRINT"INSERT OUTPUT
      DEVICE"
8A   92 PRINT:PRINT"AND PRESS RET
     URN"
91   93 OPEN 1,0:INPUT#1,A$:CLOSE
      1:PRINT
EC   99 REM
E7   100 SYS 57812 "MC CODE",8,1
E1   110 REM
FE   120 REM ALTER ABOVE LINE FOR
      NEW NAME
B7   130 REM OR TO SAVE TO TAPE E
     TC.
03   140 REM
19   150 REM
EA   160 SYS 40000
2A   170 END
D9   180 OPEN 1,0:INPUT#1,A$:CLOS
     E1
F0   260 M=M+6144
AB   265 S=0:FORI=0TO7:READD
3B   270 IFD<0THEN340
7A   280 IFD>255THEN330
0D   290 POKEM+R,D:S=S+D:R=R+1:NE
     XTI
FA   300 READD:IFD<0THEN340
A1   310 IFS=DTHENL=L+10:GOTO265
F6   320 PRINT"SUMCHECK ";
8C   330 PRINT"ERROR IN LINE";L:E
     ND
62   340 READD:IFS<>DTHEN320
D1   350 RETURN
DC   360 DATA 76,4,34,76,57,34,76
     ,212,569
65   370 DATA 34,76,18,32,76,238,
     34,76,584
D9   380 DATA 16,35,169,1,141,168
     ,2,32,564
2A   390 DATA 58,35,234,234,169,7
     ,133,185,1055
4B   400 DATA 169,0,141,230,219,1
     41,190,219,1309
1B   410 DATA 141,189,219,141,191
     ,219,141,231,1472
AB   420 DATA 219,141,229,219,141
     ,192,219,141,1501
7F   430 DATA 193,219,141,194,219
     ,141,32,208,1347
EB   440 DATA 141,33,208,169,0,14
     1,14,220,926
B9   450 DATA 133,251,169,56,133,
     252,169,23,1186
08   460 DATA 141,17,208,133,253,
     169,1,133,1055
DB   470 DATA 187,120,169,146,141
     ,20,3,169,955
EF   480 DATA 32,141,21,3,169,248
     ,141,18,773
D7   490 DATA 208,88,169,129,141,
     26,208,173,1142
1C   500 DATA 1,220,41,16,208,249
     ,169,240,1144
AD   510 DATA 141,26,208,120,169,
     49,141,20,874
34   520 DATA 3,169,234,141,21,3,
     169,27,767
6E   530 DATA 141,17,208,169,1,14
     1,14,220,911
E2   540 DATA 88,96,173,25,208,41
     ,1,208,840
30   550 DATA 3,76,49,234,141,25,
     208,165,901
5B   560 DATA 254,240,11,230,2,16
     5,2,41,945
21   570 DATA 1,208,3,76,209,33,1
     98,253,981
C2   580 DATA 165,253,201,15,240,
     13,173,17,1077
FE   590 DATA 208,41,224,5,253,14
     1,17,208,1097
1A   600 DATA 76,209,33,169,23,13
     3,253,173,1069
36   610 DATA 17,208,41,224,5,253
     ,141,17,906
0A   620 DATA 208,162,3,189,40,4,
     157,0,763
3B   630 DATA 4,189,80,4,157,40,4
     ,189,667
EE   640 DATA 120,4,157,80,4,189,
     160,4,718
4C   650 DATA 157,120,4,189,200,4
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    ,157,160,991
58  660 DATA 4,189,240,4,157,200
    ,4,189,987
28  670 DATA 24,5,157,240,4,189,
    64,5,688
7E  680 DATA 157,24,5,189,104,5,
    157,64,705
CD  690 DATA 5,189,144,5,157,104
    ,5,189,798
20  700 DATA 184,5,157,144,5,189
    ,224,5,913
39  710 DATA 157,184,5,189,8,6,1
    57,224,930
A7  720 DATA 5,189,48,6,157,8,6,
    189,608
B5  730 DATA 88,6,157,48,6,189,1
    28,6,628
7F  740 DATA 157,88,6,189,168,6,
    157,128,899
19  750 DATA 6,189,208,6,157,168
    ,6,189,929
BE  760 DATA 248,6,157,208,6,189
    ,32,7,853
15  770 DATA 157,248,6,189,72,7,
    157,32,868
DA  780 DATA 7,189,112,7,157,72,
    7,189,740
31  790 DATA 152,7,157,112,7,189
    ,192,7,823
AD  800 DATA 157,152,7,169,32,15
    7,192,7,873
25  810 DATA 232,224,37,240,3,76
    ,211,32,1055
5A  820 DATA 230,187,165,187,41,
    1,133,187,1131
25  830 DATA 169,190,133,184,160
    ,0,177,251,1264
8A  840 DATA 133,183,169,20,56,2
    29,183,133,1106
3B  850 DATA 183,169,0,141,167,2
    ,177,251,1090
D3  860 DATA 24,101,184,133,184,
    160,2,177,965
05  870 DATA 251,166,187,224,0,2
    40,2,9,1079
4D  880 DATA 128,145,184,32,217,
    33,224,0,963
FD  890 DATA 240,6,201,32,240,2,
    9,128,858
6D  900 DATA 230,184,145,184,198
    ,184,200,200,1525
9C  910 DATA 238,167,2,173,167,2
    ,197,183,1129
6B  920 DATA 208,213,224,0,240,1
    1,165,251,1312
01  930 DATA 24,105,40,133,251,1
    44,2,230,929
DE  940 DATA 252,169,248,141,18,
    208,76,188,1300
23  950 DATA 254,41,127,201,46,2
    08,4,24,905
1E  960 DATA 105,16,96,201,45,20
    8,4,56,731
AC  970 DATA 233,17,96,201,48,20
    8,4,56,863
71  980 DATA 233,5,96,201,32,208
    ,1,96,872
FF  990 DATA 201,27,144,4,56,233
    ,16,96,777
FA  1000 DATA 24,105,64,96,169,0
    ,133,251,842
04  1010 DATA 169,56,133,252,160
    ,0,169,32,971
EB  1020 DATA 145,251,136,208,24
    9,230,252,165,1636
02  1030 DATA 252,201,160,208,24
    1,169,56,133,1420
C5  1040 DATA 252,160,0,169,1,14
    5,251,165,1143
D2  1050 DATA 251,24,105,40,133,
    251,144,243,1191
35  1060 DATA 230,252,165,252,20
    1,160,208,235,1703
2E  1070 DATA 96,162,0,189,152,7
    ,157,192,955
31  1080 DATA 7,189,112,7,157,15
    2,7,189,820
0D  1090 DATA 72,7,157,112,7,189
    ,32,7,583
D4  1100 DATA 157,72,7,189,248,6
    ,157,32,868
67  1110 DATA 7,189,208,6,157,24
    8,6,189,1010
A0  1120 DATA 168,6,157,208,6,18
    9,128,6,868
05  1130 DATA 157,168,6,189,88,6
    ,157,128,899
FD  1140 DATA 6,189,48,6,157,88,
    6,189,689
96  1150 DATA 8,6,157,48,6,189,2
    24,5,643
55  1160 DATA 157,8,6,189,184,5,
    157,224,930
6C  1170 DATA 5,189,144,5,157,18
    4,5,189,878
E9  1180 DATA 104,5,157,144,5,18
    9,64,5,673
9A  1190 DATA 157,104,5,189,24,5
    ,157,64,705
2A  1200 DATA 5,189,240,4,157,24
    ,5,189,813
99  1210 DATA 200,4,157,240,4,18
    9,160,4,958
4C  1220 DATA 157,200,4,189,120,
    4,157,160,991
C5  1230 DATA 4,189,80,4,157,120
    ,4,189,747
3F  1240 DATA 40,4,157,80,4,189,
    0,4,478
95  1250 DATA 157,40,4,232,224,4
    0,240,3,940
96  1260 DATA 76,59,34,96,169,0,
    133.251.818
C0  1270 DATA 169,216,133,252,16
    0,0,169,6,1105
0D  1280 DATA 145,251,136,208,24
    9,230,252,165,1636
11  1290 DATA 252,201,220,208,24
    1,96,169,0,1387
60  1300 DATA 133,251,133,253,16
    9,4,133,252,1328
CD  1310 DATA 169,160,133,254,16
    0,0,177,251,1304
13  1320 DATA 145,253,136,208,24
    9,230,252,230,1703
EA  1330 DATA 254,165,252,201,8,
    208,239,96,1423
E1  1340 DATA 169,0,133,251,133,
    253,169,4,1112
30  1350 DATA 133,254,169,160,13
    3,252,169,54,1324
10  1360 DATA 133,1,160,0,177,25
    1,145,253,1120
CB  1370 DATA 136,208,249,230,25
    2,230,254,165,1724
21  1380 DATA 254,201,8,208,239,
    169,55,133,1267
19  1390 DATA 1,96,169,147,32,21
    0,255,169,1079
A4  1400 DATA 0,133,251,169,216,
    133,252,160,1314
FC  1410 DATA 0,173,168,2,145,25
    1,136,208,1083
4D  1420 DATA 248,230,252,165,25
    2,201,220,208,1776
63  1430 DATA 240,96,234,255,-1,
    825
BC  1550 DATA 3,7,15,30,60,60,63
    ,63,301
2B  1560 DATA 127,127,60,60,60,6
    0,63,63,620
B9  1570 DATA 15,31,62,60,60,60,
    60,60,408
10  1580 DATA 127,127,60,60,60,6
    0,60,60,614
79  1590 DATA 127,127,60,60,60,6
    0,63,63,620
03  1600 DATA 127,127,60,60,60,6
    0,63,63,620
51  1610 DATA 15,31,62,60,60,60,
    60,60,408
46  1620 DATA 126,126,60,60,60,6
    0,63,63,618
6D  1630 DATA 15,15,3,3,3,3,3,3,
    48
DB  1640 DATA 3,3,0,0,0,0,0,0,6
9C  1650 DATA 60,60,60,61,63,63,
    63,63,493
4D  1660 DATA 60,60,60,60,60,60,
    60,60,480
16  1670 DATA 56,60,62,63,63,63,
    61,60,488
76  1680 DATA 60,60,62,63,63,63,
    63,63,497
E1  1690 DATA 15,31,62,60,60,60,
    60,60,408
1F  1700 DATA 127,127,60,60,60,6
    0,63,63,620
35  1710 DATA 15,31,62,60,60,60,
    60,60,408
8B  1720 DATA 127,127,60,60,60,6
    0,63,63,620
C9  1730 DATA 15,31,62,60,60,62,
    31,15,336
90  1740 DATA 63,63,51,3,3,3,3,3
    ,192
D0  1750 DATA 126,126,60,60,60,6
    0,60,60,612
69  1760 DATA 60,60,60,60,60,60,
    60,60,480
2F  1770 DATA 60,60,60,60,60,60,
    60,61,481
82  1780 DATA 60,60,60,62,31,15,
    3,3,294
2A  1790 DATA 60;60,60,60,30,15,
    7,3,295
0D  1800 DATA 63,63,48,0,0,1,3,7
    ,185
C7  1810 DATA 60,48,48,48,48,48,
    60,0,360
9F  1820 DATA 0,0,0,0,0,0,252,25
    2,504
4A  1830 DATA 60,-1,60
04  1840 DATA 0,0,0,0,0,0,0,0,0
B1  1850 DATA 192,192,192,192,19
    2,192,192,192,1536
10  1860 DATA 240,248,124,60,60,
    124,248,224,1328
EF  1870 DATA 240,248,124,60,60,
    120,240,240,1332
2C  1880 DATA 252,252,252,188,60
    ,60,60,60,1184
86  1890 DATA 252,252,12,0,240,2
    48,124,60,1188
D3  1900 DATA 240,248,60,28,0,0,
    240,248,1064
1A  1910 DATA 252,252,60,124,248
    ,240,224,192,1592
1C  1920 DATA 240,248,124,60,60,
    124,248,240,1344
D1  1930 DATA 240,248,60,60,60,1
    24,252,252,1296
53  1940 DATA 0,102,60,255,60,10
    2,0,0,579
C8  1950 DATA 240,248,124,60,124
    ,252,252,188,1488
33  1960 DATA 0,0,0,0,0,24,24,48
    ,96
B7  1970 DATA 0,0,0,0,0,0,63,63,
    126
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30 1980 DATA 0,0,0,0,0,0,0,0,0
F1 1990 DATA 0,3,6,12,24,48,96,0,189
8F 2000 DATA 15,31,62,60,60,60,61,63,412
38 2010 DATA 3,3,3,3,15,15,3,3,48
A8 2020 DATA 15,31,60,56,0,0,0,3,165
78 2030 DATA 15,31,60,56,0,0,3,3,168
8A 2040 DATA 0,1,3,7,15,30,60,60,176
FF 2050 DATA 63,63,60,60,63,63,0,0,372
90 2060 DATA 15,31,62,60,60,60,63,63,414
E2 2070 DATA 63,63,60,60,0,1,3,3,253
A9 2080 DATA 15,31,62,60,60,62,31,15,336
7F 2090 DATA 15,31,62,60,60,62,31,15,336
7B 2100 DATA 0,-1,0
A1 2110 DATA 192,224,240,120,60,60,252,252,1400
F4 2120 DATA 240,248,124,60,60,120,240,240,1332
4D 2130 DATA 240,248,60,28,0,0,0,0,576
0B 2140 DATA 192,224,240,120,56,60,60,60,1012
BF 2150 DATA 252,252,12,0,0,0,224,224,964
69 2160 DATA 252,252,12,0,0,0,224,224,964
DE 2170 DATA 240,248,60,28,0,0,252,252,1080
DB 2180 DATA 126,126,60,60,60,60,252,252,996
D3 2190 DATA 240,240,192,192,192,192,192,192,1632
D1 2200 DATA 252,252,240,240,240,240,240,240,1944
BC 2210 DATA 62,124,248,240,224,192,128,128,1346
87 2220 DATA 0,0,0,0,0,0,0,0,0
BA 2230 DATA 7,15,31,63,255,255,239,207,1072
41 2240 DATA 60,60,60,60,188,252,252,252,1184
4A 2250 DATA 240,248,124,60,60,60,60,60,912
A1 2260 DATA 240,248,124,60,60,124,248,240,1344
96 2270 DATA 240,248,124,60,60,60,60,60,912
BD 2280 DATA 240,248,124,60,60,124,248,240,1344
5A 2290 DATA 240,248,60,28,0,0,240,248,1064
DB 2300 DATA 252,252,204,192,192,192,192,192,1668
65 2310 DATA 126,126,60,60,60,60,60,60,612
36 2320 DATA 60,60,60,60,60,60,60,60,480
BD 2330 DATA 15,15,15,15,15,15,207,239,536
12 2340 DATA 60,60,60,124,248,240,192,192,1176
51 2350 DATA 60,60,60,60,120,240,224,192,1016
2E 2360 DATA 252,252,60,124,248,240,224,192,1592
A6 2370 DATA 0,-1,0
DB 2380 DATA 60,60,60,60,60,60,0,0,360
B5 2390 DATA 60,60,60,60,127,127,0,0,494
6A 2400 DATA 60,60,60,62,31,15,0,0,288
29 2410 DATA 60,60,60,60,127,127,0,0,494
4F 2420 DATA 60,60,60,60,127,127,0,0,494
5B 2430 DATA 60,60,60,60,126,126,0,0,492
D2 2440 DATA 60,60,60,62,31,15,0,0,288
17 2450 DATA 60,60,60,60,126,126,0,0,492
3E 2460 DATA 3,3,3,3,15,15,0,0,42
08 2470 DATA 0,0,56,60,31,15,0,0,162
35 2480 DATA 63,63,61,60,60,60,0,0,367
39 2490 DATA 60,60,60,60,127,127,0,0,494
03 2500 DATA 60,60,60,60,60,60,0,0,360
E9 2510 DATA 61,60,60,60,60,60,0,0,361
E2 2520 DATA 60,60,60,62,31,15,0,0,288
27 2530 DATA 60,60,60,60,126,126,0,0,492
03 2540 DATA 60,62,31,15,0,0,0,0,168
D3 2550 DATA 63,63,61,60,126,126,0,0,499
6D 2560 DATA 0,0,56,60,31,15,0,0,162
53 2570 DATA 3,3,3,3,7,7,0,0,26
51 2580 DATA 60,60,60,62,31,15,0,0,288
8D 2590 DATA 60,60,30,15,7,3,0,0,175
1B 2600 DATA 63,63,63,63,62,60,0,0,374
EF 2610 DATA 15,31,62,60,60,60,0,0,288
25 2620 DATA 3,3,3,3,7,7,0,0,26
7A 2630 DATA 15,31,62,60,63,63,0,0,294
65 2640 DATA 195,207,207,207,207,207,195,255,1680
D7 2650 DATA 0,0,0,0,0,0,0,0,0
0F 2660 DATA 24,-1,24
8B 2670 DATA 0,0,0,0,0,0,0,0,0
59 2680 DATA 192,192,192,192,252,252,0,0,1272
6D 2690 DATA 192,0,0,12,252,252,0,0,708
30 2700 DATA 120,60,60,124,248,240,0,0,852
51 2710 DATA 255,255,60,60,60,60,0,0,750
B6 2720 DATA 60,60,60,124,248,240,0,0,792
AA 2730 DATA 124,60,60,124,248,240,0,0,856
0A 2740 DATA 192,192,192,192,192,192,0,0,1152
BE 2750 DATA 120,60,60,124,248,240,0,0,852
7E 2760 DATA 60,60,60,124,248,240,0,0,792
89 2770 DATA 255,153,195,0,195,153,255,255,1461
7A 2780 DATA 60,60,60,124,248,240,0,0,792
F8 2790 DATA 255,255,255,255,255,231,231,207,1944
09 2800 DATA 0,0,0,0,0,0,0,0,0
EB 2810 DATA 0,0,3,3,3,3,0,0,12
0A 2820 DATA 255,252,249,243,231,207,159,255,1851
D3 2830 DATA 63,62,60,62,31,15,0,0,293
38 2840 DATA 3,3,3,3,63,63,0,0,138
E3 2850 DATA 15,31,62,60,63,63,0,0,294
D0 2860 DATA 0,0,56,60,31,15,0,0,162
3F 2870 DATA 63,63,0,0,0,0,0,0,126
94 2880 DATA 0,0,56,60,31,15,0,0,162
61 2890 DATA 62,60,60,62,31,15,0,0,290
25 2900 DATA 3,3,3,3,3,3,0,0,18
F4 2910 DATA 30,60,60,62,31,15,0,0,258
7C 2920 DATA 0,0,56,60,31,15,0,0,162
46 2930 DATA 255,-1,255
19 2940 DATA 60,60,60,60,60,60,0,0,360
91 2950 DATA 120,60,60,124,248,240,0,0,852
F2 2960 DATA 0,0,28,60,248,240,0,0,576
E1 2970 DATA 60,56,120,240,224,192,0,0,892
33 2980 DATA 0,0,0,12,252,252,0,0,516
CA 2990 DATA 0,0,0,0,0,0,0,0,0
93 3000 DATA 60,60,60,124,248,240,0,0,792
59 3010 DATA 60,60,60,60,126,126,0,0,492
43 3020 DATA 192,192,192,192,240,240,0,0,1248
87 3030 DATA 240,240,240,240,224,192,0,0,1376
DD 3040 DATA 192,224,240,248,124,62,0,0,1090
45 3050 DATA 0,0,0,12,252,252,0,0,516
DB 3060 DATA 15,15,15,15,15,15,0,0,90
D9 3070 DATA 252,252,124,60,60,60,0,0,808
D0 3080 DATA 60,60,60,124,248,240,0,0,792
AD 3090 DATA 0,0,0,0,0,0,0,0,0
69 3100 DATA 60,120,224,240,252,124,0,0,1020
16 3110 DATA 192,224,240,248,124,62,0,0,1090
22 3120 DATA 124,60,60,124,248,240,0,0,856
B5 3130 DATA 192,192,192,192,224,224,0,0,1216
B4 3140 DATA 60,60,60,124,248,240,0,0,792
2F 3150 DATA 60,60,120,240,224,192,0,0,896
57 3160 DATA 255,255,255,63,31,15,0,0,874
7C 3170 DATA 240,248,124,60,60,60,0,0,792
EB 3180 DATA 192,192,192,192,224,224,0,0,1216
A3 3190 DATA 128,0,0,12,252,252,0,0,644
4D 3200 DATA 231,-1,231
7B 3210 DATA 169,0,133,251,133,253,169,31,1139
A9 3220 DATA 133,254,169,55,133,252,160,0,1156
D6 3230 DATA 177,251,145,253,136,208,249,230,1649
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90  3240 DATA 252,230,254,165,254,201,56,208,1620
9D  3250 DATA 239,169,31,133,252,169,251,162,1406
F8  3260 DATA 0,160,56,32,216,255,96,255,-1,1070
ED  3270 DATA 11,8,0,0,158,50,48,54,329
B4  3280 DATA 51,0,0,0,0,0,165,186,402
3A  3290 DATA 201,126,240,37,169,0,133,251,1157
88  3300 DATA 133,253,169,160,133,254,56,233,1391
6B  3310 DATA 23,133,252,160,0,177,251,145,1141
EA  3320 DATA 253,136,208,249,198,252,198,254,1748
78  3330 DATA 165,252,201,8,208,239,32,0,1105
92  3340 DATA 32,169,126,133,186,169,28,141,984
F5  3350 DATA 24,208,173,255,47,133,254,32,1126
3B  3360 DATA 9,32,169,21,141,24,208,32,-1,636
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PROGRAM: EDITOR/SCROLLER

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B4  100 IFDV<>0THEN231
29  101 POKE52,31:POKE56,31:CLR
E8  102 POKE53281,6:PRINT"[CLR]";:POKE53280,1:POKE53281,1:PRINT"[HOME,BLUE]";:H=14736:C1=0:C2=0
38  103 FORI=0TO7:POKE10240+(I*3),255:POKE10241+(3*I),0:POKE10242+(3*I),0:NEXT
49  104 FORI=10263TO10303:POKEI,0:NEXT:POKE53287,0:POKE53275,1
C9  105 POKE53249,50:POKE53248,24
D6  106 SP=1:FR=1:BR=0:FORI=0TO7:POKE13680+I,0:POKE13808+I,0:POKE12656+I,0
3E  107 POKE12784+I,0:NEXT:FORI=0TO3:POKE13682+I,3:POKE13810+I,192:NEXT
A3  108 POKE53269,1:SYS8192:POKE2040,160
34  109 POKE53248,24+(8*C2):POKE53249,50+(8*C1)
91  110 GETA$:IFA$=""THEN110
9D  111 K=0:IFA$="*"THEN125
47  112 IFA$="←"THEN182
E9  113 IFA$="[RIGHT]"THENC2=C2+1:IFC2>16THENC2=16
FC  114 IFA$=CHR$(20)THENC2=C2-1:IFC2<0THENC2=0
3C  115 IFA$="[DOWN]"THENGOSUB163
3B  116 IFA$="[UP]"THENGOSUB169
80  117 IFA$=CHR$(13)THENGOSUB175
F4  118 IFA$="."ORA$=" "ORA$="-"THENK=1
DA  119 IF(A$>="0"ANDA$<="9")THENK=1
ED  120 IF(A$>="A"ANDA$<="Z")THENK=1
B2  121 IFK=0THEN109
E6  122 A=ASC(A$)AND191:POKE1024+(C1*40)+C2,A:POKE55296+(C1*40)+C2,6
A7  123 C2=C2+1:IFC2>16THENC2=16
4F  124 GOTO109
F2  125 REM
D4  126 SYS8204:POKE53269,0
C7  127 PRINT"[CLR,BLUE]":PRINTTAB(13);"DISPLAY  TITLE":PRINTTAB(12);"---------------"
B6  128 PRINT:PRINT"SPEED [BLACK]02":POKE198,0
4E  129 POKE1191,SP+49
8A  130 GETA$:IFA$=CHR$(13)THEN133
0D  131 IFA$="[DOWN]"THENPOKE198,0:SP=(SP+1)AND1:POKE1191,SP+49
3D  132 GOTO130
15  133 PRINT:PRINT"[BLUE]FOREGROUND COLOUR (INK) [BLACK]01"
CF  134 POKE198,0
56  135 IFFR<10THENPOKE1288,48:POKE1289,FR+48
C1  136 IFFR>10THENPOKE1288,49:POKE1289,FR+38
3F  137 GETA$:IFA$=CHR$(13)THEN142
EF  138 IFA$<>"[DOWN]"THEN137
32  139 POKE198,0:FR=(FR+1)AND15:IFFR<10THENPOKE1288,48:POKE1289,FR+48
25  140 IFFR>9THENPOKE1288,49:POKE1289,FR+38
3D  141 GOTO137
EE  142 PRINT:PRINT"[BLUE]BACKGROUND COLOUR (PAPER) [BLACK]00"
B4  143 POKE198,0
A5  144 IFBR<10THENPOKE1370,48:POKE1371,BR+48
3C  145 IFBR>10THENPOKE1370,49:POKE1371,BR+38
3A  146 GETA$:IFA$=CHR$(13)THEN151
C6  147 IFA$<>"[DOWN]"THEN146
27  148 POKE198,0:BR=(BR+1)AND15:IFBR<10THENPOKE1370,48:POKE1371,BR+48
C4  149 IFBR>9THENPOKE1370,49:POKE1371,BR+38
9A  150 GOTO146
81  151 POKE254,SP:POKE8211,FR:POKE8225,BR
F6  152 POKE53272,28:SYS8201:POKE53272,21
9A  153 POKE53280,1:POKE53281,1
86  154 PRINT"[CLR,BLUE]A] RE-ENTER TITLES"
D0  155 PRINT"[DOWN]B] RE-ROLL TITLES"
46  156 PRINT"[DOWN]CHOOSE [A/B]":POKE198,0
C3  157 GETA$:IFA$=""THEN157
65  158 IFA$="B"THEN127
FC  159 IFA$<>"A"THEN157
82  160 POKE53281,6:PRINT"[CLR]";:POKE53281,1:PRINT"[HOME,BLUE]";
AE  161 SYS8207:POKE53280,1:SYS8198
82  162 POKE53269,1:GOTO109
2C  163 REM
D4  164 C2=0:C1=C1+1:IFC1<25THENRETURN
4C  165 C1=24:IFH>39976THENRETURN
CC  166 SYS59626:A=20-PEEK(H+1000):FORI=1TOA
86  167 POKE1983+I,PEEK(H+1000+(2*I)):NEXT:SYS8198
68  168 H=H+40:RETURN
26  169 REM
7E  170 C2=0:C1=C1-1:IFC1>=0THENRETURN
28  171 C1=0:IFH-40<14736THENRETURN
4E  172 SYS8195:H=H-40:A=PEEK(H)
E8  173 FORI=0TO16:POKE1024+I,32:NEXT
97  174 FORI=1TO(20-A):POKE1023+I,PEEK(H+(I*2)):NEXT:SYS8198:RETURN
20  175 REM
53  176 B=H+(C1*40):POKEB,20-C2:IFC2=0THENPOKEB,19:POKEB+2,32:GOTO181
B3  177 FORI=1TOC2:A=PEEK(1023+(C1*40)+I)
ED  178 POKEH+(C1*40)+(I*2),A:NEXT
A0  179 FORI=C2TO16:POKE1024+I+(C1*40),32:NEXT
8B  180 GOTO163
84  181 FORI=0TO16:POKE1024+(C1*40)+I,32:NEXT:GOTO163
69  182 SYS8204:POKE53269,0:POKE198,0
62  183 PRINT"[CLR,RED,DOWN]INPUT/OUTPUT"
81  184 PRINT"------------"
11  185 PRINT:PRINT"1] LOAD TITLE DATA"
0A  186 PRINT:PRINT"2] SAVE TITLE DATA"
A7  187 PRINT:PRINT"3] CREATE A DEMO TITLE"
FB  188 PRINT:PRINT"←] ABORT I/O AND RETURN TO EDIT SCREEN"
A2  189 PRINT:PRINT"MAKE YOUR CHOICE PLEASE"
09  190 GETA$:IFA$=""THEN190
F0  191 IFA$="←"ANDH2=26THENPOKE198,0:GOTO231
E0  192 IFA$="←"THENPOKE53269,1:PRINT"[CLR,BLUE]";:SYS8198:SYS8207:POKE198,0:GOTO109
35  193 IFA$="1"THEN215
32  194 IFA$="2"THEN197
0B  195 IFA$="3"THEN235
77  196 GOTO190
64  197 POKE198,0:IFDV>7THENDV=0
99  198 PRINT"[CLR,GREEN]SAVE TITLE DATA"
E5  199 PRINT"---------------"
7A  200 H1=H+(C1*40):H2=INT(H1/256):H1=H1-(H2*256)
74  201 GOSUB251
85  202 GOSUB266
52  203 PRINT
63  204 PRINT"[GREEN]SET YOUR ";:IFDV=1THENPRINT"[BLACK]TAPE"
16  205 IFDV<>1THENPRINT"[BLACK]DISK DRIVE"
7E  206 PRINT:PRINT"[GREEN]AND PRESS 'RETURN'"
E2  207 PRINT:PRINT"TO SAVE YOUR TITLE DATA"
14  208 PRINT:PRINT"WITH THE NAME - [BLACK]";FL$
DA  209 POKE198,0
A4  210 GETA$:IFA$<>CHR$(13)THEN210
26  211 POKE198,0:SYS57812FL$,DV,1
D1  212 POKE251,0:POKE252,57
C5  213 POKE780,251:POKE781,H1:POKE782,H2:SYS65496
DB  214 GOTO183
CE  215 POKE198,0:IFDV>7THENDV=0
F8  216 PRINT"[CLR,GREEN]LOAD TITLE DATA"
87  217 PRINT"---------------"
ED  218 GOSUB251
F4  219 GOSUB266
45  220 PRINT
FC  221 PRINT"[GREEN]SET YOUR ";:IFDV=1THENPRINT"[BLACK]TAPE
```

```
     "
37   222 IFDV<>1THENPRINT"[BLACK]
     DISK DRIVE"
4F   223 PRINT:PRINT"[GREEN]AND P
     RESS 'RETURN'"
F0   224 PRINT:PRINT"TO LOAD YOUR
      TITLE DATA"
13   225 PRINT:PRINT"WITH THE NAM
     E - [BLACK]";FL$
2B   226 POKE198,0
F9   227 GETA$:IFA$<>CHR$(13)THEN
     227
B5   228 POKE198,0:SYS8192
67   229 LOADFL$,DV,1
E1   230 H2=26:GOTO183
DC   231 PRINT"[CLR]":SYS8198:H=1
     4736:FORI=0TO24
14   232 H1=20-PEEK(H+(I*40)):FOR
     J=1TOH1
D5   233 POKE1023+(I*40)+J,PEEK(H
     +(I*40)+(J*2)):NEXTJ,I
D5   234 POKE53269,1:C1=0:C2=0:GO
     TO109
F1   235 PRINT"[CLR,C1]CREATE DEM
     O"
AC   236 PRINT"-----------"
19   237 IFDV>7THENDV=0
B6   238 GOSUB251:GOSUB266
93   239 H1=H+(C1*40):H2=INT(H1/2
     56):H1=H1-(H2*256):POKE8709,
     H1:POKE8713,H2
8F   240 PRINT:PRINT"[C1]SET YOUR
      ";:IFDV=1THENPRINT"[BLACK]T
     APE"
9A   241 IFDV<>1THENPRINT"[BLACK]
     DISK DRIVE"
E1   242 PRINT:PRINT"[C1]AND PRES
     S 'RETURN'"
EF   243 PRINT:PRINT"TO SAVE YOUR
      TITLE DEMO"
60   244 PRINT:PRINT"WITH THE NAM
     E - [BLACK]";FL$
0B   245 POKE198,0:POKE8734,H2
3B   246 GETA$:IFA$<>CHR$(13)THEN
     246
CB   247 POKE198,0:SYS57812FL$,DV
     ,0
BB   248 POKE251,1:POKE252,31:POK
     E780,251:POKE781,H1:POKE782,
     H2:POKE12287,SP
F7   249 SYS65496:POKE8709,0:POKE
     8713,56:POKE8734,56
CF   250 GOTO183
01   251 PRINT"[HOME,DOWN4,BLUE]W
     HICH DEVICE ? ";
C8   252 IFDV=1THENPRINT"[BLACK]T
     APE"
B7   253 IFDV=0THENPRINT"[BLACK]D
     ISK"
19   254 GETA$:IFA$=CHR$(13)THEN2
     57
2B   255 IFA$<>"[DOWN]"THEN254
FD   256 POKE198,0:DV=(DV+1)AND1:
     GOTO251
72   257 IFDV=1THEN265
4F   258 PRINT"[HOME,DOWN6,BLUE]W
     HICH DEVICE NUMBER ? ";:POKE
     198,0
BB   259 IFDN=0THENPRINT"[BLACK]8
     "
88   260 IFDN=1THENPRINT"[BLACK]9
     "
43   261 GETA$:IFA$=CHR$(13)THEN2
     64
A0   262 IFA$<>"[DOWN]"THEN261
C3   263 POKE198,0:DN=(DN+1)AND1:
     GOTO258
69   264 DV=8+DN
84   265 RETURN
E8   266 FL$="":POKE53248,160:POK
     E53249,114:POKE53269,1
66   267 PRINT"[HOME,DOWN8,SPC37]
     "
F0   268 PRINT"[HOME,DOWN8,BLUE]E
     NTER FILENAME - [BLACK]";FL$
     :POKE53248,160+(LEN(FL$)*8)
60   269 ER=1
7F   270 GETA$:IFA$=""THEN270
C1   271 IF(A$>="A")AND(A$<="Z")T
     HENER=0
73   272 IF(A$>="0")AND(A$<="Z")T
     HENER=0
A4   273 IFA$=CHR$(13)THEN281
FF   274 IFA$=CHR$(20)THEN278
96   275 IFERTHEN270
CF   276 IFLEN(FL$)<11THENFL$=FL$
     +A$:GOTO267
87   277 IFLEN(FL$)=11THEN269
D4   278 IFLEN(FL$)=0THEN269
F3   279 IFLEN(FL$)=1THENFL$="":G
     OTO267
BF   280 FL$=LEFT$(FL$,(LEN(FL$)-
     1)):GOTO267
75   281 IFLEN(FL$)=0THEN269
3B   282 POKE53269,0:RETURN
```


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Life-Savers

Looking for a Basic or machine code routine? Want to know a specific POKE? We provide all this and more.

Whenever you go out for a drive in a car you never have to reinvent the wheel before you can get anywhere, the wheel is here to stay. Why isn't it like this with computers? Every time a programmer writes a program he/she will no doubt rewrite routines that have been used many times before.

In the February 1987 issue of *Your Commodore* we launched a series titled **Machine Code Library** where we were going to publish machine code routines that people find handy. Letters flooded in from Basic programmers asking for something similar for them, so here it is – a totally revamped series – **Life-Savers.**

Within this series we will be bringing you a whole range of life-saving information. We may produce a machine code listing to read the error channel on a disk drive or multiply two numbers together, a Basic routine to print a scrolling message could be printed – you may even find a series of handy POKEs for the Plus/4. Just what we print is up to you, since it is you the readers that we are relying on for all of those invaluable routines and interesting POKEs.

Cut it out

Life-savers will be published in such a way that they may be cut-out or photocopied and stuck onto a card suitable for a card index box. This means that you will always have useful information at your fingertips. An index of the cards published will also be printed on a regular basis.

Send it in

As mentioned above we are relying on you the reader to make this series an invaluable reference. We are relying on you to send in all of those machine code subroutines, short Basic programmes and other hints and tips for all the Commodore computers. Ten pounds per card printed will be paid to the author, of course longer tips, etc, will be spread over more than one card.

So get to it, get those hints, tips and programmes sent off. A cassette or disk should be sent with any programmes, which will of course be returned to you.

Send your Life-Savers to:

Life-Savers
Your Commodore
1 Golden Square
London
W1R 3AB

LIFESAVERS 1	C64	M/C SAVE CALCULATOR	1/1

Unlike some Commodore computers the C64 does not have a command to SAVE blocks of machine code to disk or tape.

Most programmers know that you can SAVE an area of memory by POKEing memory locations 43,44 and 45,46 with the start and end address of the code to placed on disk/tape and a SAVE command being executed. The only problem with this is trying to figure out what values to POKE into each location.

This short program when given the start and end address, in decimal, will display on the screen the necessary POKE instructions saving you from having to work out the values yourself.

S.Garton

```
1 REM ***************************
2 REM *  M/C SAVE CALCULATOR    *
3 REM ***************************
10 PRINT "[CLR,DOWN3,RIGHT9]M/C
SAVE CALCULATOR"
15 PRINT "[RIGHT9,CY19]"
20 PRINT "[DOWN2] INPUT START AD
DRESS IN DECIMAL"
30 INPUT"[DOWN,SPC3]";S
40 PRINT "[DOWN] INPUT END ADDRE
SS IN DECIMAL"
50 INPUT"[DOWN,SPC3]";E
60 HS =INT(S/256) : LS=S-(HS*256
)
70 HE =INT(E/256) : LE=E-(HE*256
)
90 PRINT "[DOWN] THE NUMBERS TO
POKE ARE :"
100 PRINT"[DOWN]  POKE 43,";LS
110 PRINT"  POKE 44,";HS
120 PRINT"  POKE 45,";LE
130 PRINT"  POKE 46,";HE
```

LIFESAVERS 2	C64	M/C SAVE SUBROUTINE	1/1

Presented here you will find a Basic subroutine that can be appended to any Basic program that requires a machine code SAVE to take place.

Before you call the routine you need to set up the variables as documented in the programmes REM statements. The routine should be called with a GOSUB since it ends with a RETURN instruction.

A.Webb

```
1000 REM * MACHINE CODE SAVE ROU
TINE *
1001 REM SA  = START ADDRESS
1010 REM EA  = END ADDRESS
1015 REM DE  = DEVICE FOR SAVE
1020 REM FI$ = FILE NAME
1030 POKE194,SA/256:POKE193,SA-P
EEK(194)*256
1040 POKE175,EA/256:POKE174,EA-P
EEK(175)*256
1050 L=LEN(FI$)
1060 FORI=1TOL:POKE1023+I,ASC(MI
D$(FI$,I,1)):NEXT
1070 POKE 187,0:POKE188,4:POKE18
3,L:POKE186,DE:SYS 62954
1080 RETURN
```

LIFESAVERS 3	1541	1/2 TRACK READER	1/1

How often have you used a disk on one drive only to find that it will not work on another?

This problem is usually caused by one of the disk drives being out of alignment, and a service is probably called for.

Presented here is a short Basic program that will increase the chances of being able to read a file from a disk that is slightly out of alignment. As an extra feature it will also get rid of the awful head banging that some forms of disk protection cause on your drive.

```
1 REM ***************************
***
2 REM * 1/2 TRACK READER FOR 154
1 *
3 REM ***************************
***
10 INPUT"BUMPS (Y/N) ";B$
20 IF B$<>"Y"THENE=E+128
30 INPUT "HALF TRACK SEEKS (Y/N)
 ";S$
40 IFS$<>"Y"THENE=E+64
50 INPUT "NUMBER OF LOADING ATTE
MPTS ";A
60 IF A<0THEN100
70 IFA>31THENA=31
80 E=E+A
90 REM** TELL THE DRIVE **
100 OPEN15,8,15
110 PRINT#15,"M-W"CHR$(106)CHR$(
0)CHR$(1)CHR$(E)
120 CLOSE15:END
```

LIFESAVERS 4	C64	M/C RANDOM NUMBERS	1/1

You can't have too many ways of generating random numbers. You need them all the time – in games anyway.

Of course the routine presented here is not totally random, but pseudo-random, but short of tying your c64 into a radioisotope source what else can you expect? The main thing is that it's pretty unprdictable.

It's best to seed the four bytes from $8B onwards with indeterminate numbers (eg from the clock). The routine delivers a number between 0-255 in the Accumulator. If you want to use this from Basic, make sure you store this number before you RTS.

F.Fahey

```
 10 ;*********************
 20 ;one        byte rand ***
 30 ;*********************
 50 ;random     constants
 70 const       dfb $53,$b5,$76
 80 rseed       equ $8b
100             org $9000
120 rndst       ldy £8
130 rndl1       clc
140             lda rseed+3
150             bpl rndzb
160             ldx £2
170 rndl2       lda rseed,x
180             eor const,x
190             sta rseed,x
200             dex
210             bpl rndl2
220             sec
230 rndzb       rol rseed
240             rol rseed+1
250             rol rseed+2
260             rol rseed+3
270             dey
280             bne rndl1
290             lda rseed+3
300             rts
```

Listings

Get it right first time with our deluxe program system for the C64.

You may have noticed that our listings are free of those horrible little black blobs which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the funny numbers by the side of each line of the listing. Fret no more, it's all part of our easy entry aid.

Instead of those nasty graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an ace of spades in layman's terms, and [SA10] would mean a row of ten of these symbols.

[S+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] means exactly the same thing except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key.

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SSPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:
[CTRL N, DOWN2,LEFT5,BLUE, F3,C3]

This would be achieved by holding down the CTRL key as you press N, press the cursor key down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the F3 key and, finally hold the Commodore key down while pressing the number two key (C2 would of course make the computer print in brown).

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no commas, unless something like this appears:
[SS],[C*]
In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT & 2) and delete it. This gets the computer out of quotes mode. Hold down CTRL and press the number nine key (RVSON), type the relevant number of reversed T's and then hold down CTRL and press zero (RVSOFF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string: the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:
:CC=2*[PI]*R:
Ignore the square brackets and just type in a shifted upward pointing arrow (ie. the pi symbol).

PROGRAM: SYNTAX CHECKER

```
5 REM SYTAX CHECKER - ERIC DOYLE

10 BL=10    :LN=70    :SA=49152
20 FOR L=0 TO BL:CX=0:FOR D=0 TO
 15
30 READ A:IF A>255THENPRINT"NUMB
ER TO LARGE";LN+(L*10):STOP
40 CX=CX+A:POKE SA+L*16+D,A:NEXT
 D
50 READ A:IF A><CX THENPRINT"ERR
OR IN LINE";LN+(L*10):STOP
60 NEXT L:SYS 49152:NEW
70 DATA 173,5,3,201,165,208,31,1
20,169,9,141,32,208,141,33,208,1
847
80 DATA 169,7,141,134,2,169,13,3
2,210,255,169,64,141,4,3,169,168
2
90 DATA 192,141,5,3,88,96,120,16
9,124,141,4,3,169,165,141,5,1566

100 DATA 3,169,14,141,134,2,141,
32,208,169,6,141,33,208,88,96,15
85
110 DATA 32,124,165,72,138,72,15
2,72,162,0,165,20,133,254,165,21
,1747
120 DATA 24,101,254,133,254,189,
0,2,240,18,69,254,133,254,232,18
9,2346
130 DATA 0,2,240,8,24,101,254,13
3,254,232,208,233,169,1,141,134,
2134
140 DATA 2,165,254,74,74,74,74,3
2,156,192,32,210,255,165,254,41,
2054
150 DATA 15,32,156,192,32,210,25
5,169,13,32,210,255,169,13,32,21
0,1995
160 DATA 255,169,7,141,134,2,104
,168,104,170,104,96,24,105,48,20
1,1832
170 DATA 58,16,1,96,24,105,7,96,
0,0,0,0,0,0,0,0,403
```

by Eric Doyle

Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

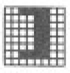
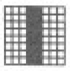
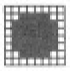
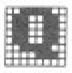
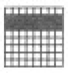
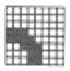
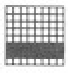
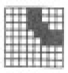
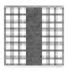
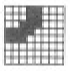
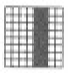
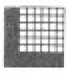
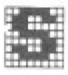
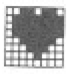
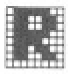
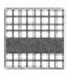
Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk immediately because it will be used with most of the present and future listings appearing in Your Commodore.

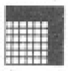
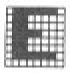
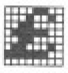
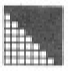
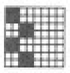
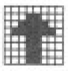
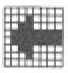
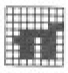
At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and press RETURN again.

If you want to turn off the checker simply type SYS49152 and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same SYS command.

No system is foolproof but the chances of two errors cancelling one another out are so remote that we believe our listings are more reliable than any other magazine in the world. So get typing!

Mnemonic	Symbol	Keypress
[RIGHT]		CRSR left/right
[LEFT]		SHIFT & CRSR left/right
[DOWN]		CRSR up/down
[UP]		SHIFT & CRSR up/down
[F1]		f1 key
[F2]		SHIFT & f1 key
[F3]		f3 key
[F4]		SHIFT & f3 key
[F5]		f5 key
[F6]		SHIFT & f5 key
[F7]		f7 key
[F8]		SHIFT & f7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RVSON]		CTRL & 9
[RVSOFF]		CTRL & 0

Mnemonic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		£
[LARROW]		←
[UPARROW]		↑
[PI]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		see text
[Cletter]		CBM + letter
[Sletter]		SHIFT + letter

Software for sale

If you think that one of our programmes looks very interesting, but you can't afford the time to type it in then our software service will help you out.

It's three o'clock in the morning. You sit at the computer keyboard just finished a marathon typing session entering one of the superb programs from *Your Commodore*. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how lo ng look or how many people help you, you can usually antee that at least one little bug slips through unnoticed. The *Your Commodore* Software Service makes available ... of the programs from each issue on both cassette and disk at a price of £6.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB.
TEL: (0442) 48435

please contact this address for prices and availability.

The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format you will also find a couple of symbols after this strap. The symbols have the following meaning:

This symbol means that the program is available on cassette.

These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk only programs on tape. There is no sense in placing a program that expects to be reading from disk on to tape. YC

APRIL 1987

CRIBBAGE – A computerised version of this popular card game. Plus/4, disk only.
DISKIT 4 – A protection program to look after your C64 programs. (Disk only).
DISKIT 5 – A machine code to DATA statement convertor for C64. (Disk only).
C128 KEYPAD MODIFIER – Make your numeric keypad more useful where entering data.
LETTER WRITER – A novel way to send musical letters to your friends. (C64).
DOUBLE PRINT – The bigger the better. Give your C64 double height characters.

ORDER CODE
DISK YDAPR87 £6.00
TAPE YCAPR87 £4.00

MAY 1987

LOWER CASE GRAPHICS – Using lower case text on your C16 and Plus/4 graphics screen. (On disk only).
C16 CHARACTER EDITOR – A powerful character editor for the C16 and Plus/4. (On disk only).
EVERYMAN'S GUIDE TO GRAPHICS – All of the programs from this fascinating article.
C64 SPRITE EDITOR – A comprehensive sprite editor for the C64. Available for both disk and tape.
CEDIT 64 – A character editor with no fewer than 44 different commands. (Available for tape and disk).

ORDER CODE
DISK YDMAY87 £6.00 TAPE YCMAY87 £4.00

JUNE 1987

DUAL PROGRAMMING – Have two programs in your Plus/4's memory at once. (On disk only).
EMULATOR 64 – Machine code single stepper for the C64.
SMART LISTER – Make your listings smarter and neater

with this program. (C64).
PROCEDURES – Easier programming for the C64 with this program.
C64 **SOURCE GENERATOR** – A powerful disassembler for the C64.
LIST ENHANCER – Improve the LIST command of your C64.
ANALYSER – A machine code debugger for the C128.

ORDER CODE
DISK YDJUN87 £6.00
TAPE YCJUN87 £4.00

JULY 1987

UTILITY COMMANDS — This provides many vital commands missing from Basic 7.0 on the 128.
PLUS/4 AND C64 CRUNCHER — Speed up your programs with these handy utilities.
PROGRAMMABLE FUNCTION KEYS — A utility to make more use of the function keys on the C64.
DISKIT 5 — A handy routine to convert memory to data statements on the C64. (Disk only).
ARCADE ACTION — Get those sprites with these handy arcade routines on the C64.
CROSS REFERENCE — This program helps you sort out your variables on the C64.
SUICIDE RUN — A fast and stimulating game for the C64.

ORDER CODE
DISK YDJULY87 £6.00
TAPE YCJULY87 £4.00

AUGUST 1987

DISKIT 6 — Copy your disk programmes to turbo tape with ease. (C64). C64, Disk only.
SCREEN MAKER — Design text and low-res graphic screens with ease. (C64).
SCREEN DUMP — A Hi-Res screen dump for the C64 plus MPS801 printer.
NUMBER BASE TUTOR — A C64 educational program helping with tuition of number bases other than 10.
C16 SPRITE — Does your C16 lack something? Then add sprites with this useful utility. For C16 and Plus/4, available on disk only.
WINDOWS — A text window system for the C64.

Order Codes
DISK YDAUG87 £6.00
TAPE YCAUG87 £4.00

Cassettes or disks are available back to March 1986. Please ring the Editorial office (01-437-0626) for details of these.

ORDER FORM – PLEASE COMPLETE IN BLOCK CAPITALS

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SEPTEMBER '87		DISK (£6.00)	YD SEP 87	
OVERSEAS POST £1				
			TOTAL	

NAME. . . . .

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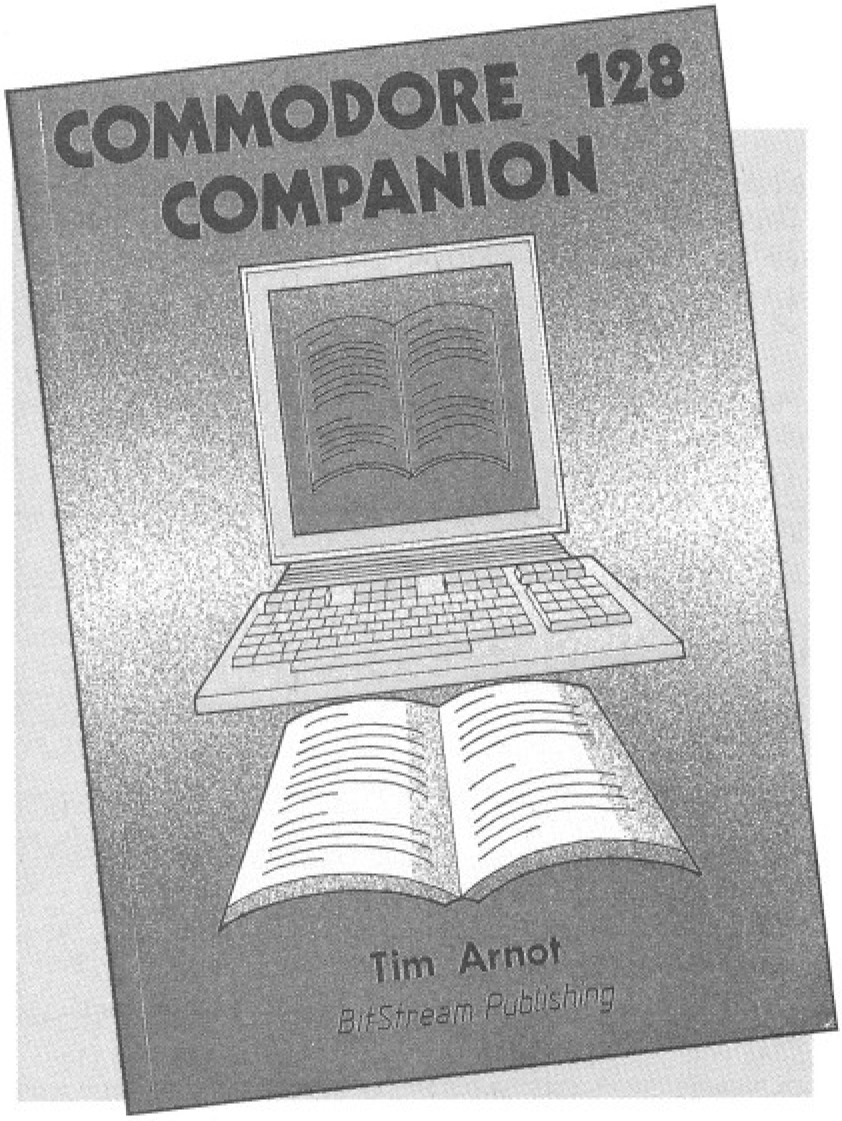
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Books

To keep up-to.date with what's on the bookshelves, read on.



Commodore 128 Companion

By far the greatest challenge to a book reviewer is the assessment of a dictionary. In computer terms the equivalent is a book like the Commodore 128 Companion. It is by no means a 'good read' in the conventional sense but to those who need its vast tables of memory locations, Basic breakdowns and chip characteristics it will more than justify the £10 price tag.

Despite the technical nature of the book, it reveals an honest but critical approach to the C128 and you soon realise that this book has its roots in that noble fellowship of Commodore users: ICPUG (the Independent Commodore Products Users Group). For example, the first section is the usual appraisal of the 128 in the context of the wider world of computers but does point out the failings of the machine's CP/M mode. The 1571 drive will read from and write to standard MFM system CP/M disk but cannot format the wretched things!

Immediately you get the impression that this is not a sycophantic stroll through the 128 but a serious attempt at coming to terms with the machine's failings as well as its undoubted assets.

The first section of detailed information lays bare the Basic implémentation. Each keyword is dealt with in great depth and the header to each page lays out all the parameters relating to the word. The token value representing the word, accepted abbreviation and syntax are supplemented by further details of the location of the keyword in both 128 and 64 modeROMS in addition to the dispatch vector and actual start of the ROM routine.

This gives way to a further exposition of Basic program storage in memory and variable formats. Greater depth in the description of floating point storage would have been helpful in this section to further clarify a rather thorny subject but this is glossed over as usual.

It is outside the brief of such a book to give detail on machine code programming, but to those who have penetrated the mystic implementation of 6500 series coding the location of kernal jump routines are detailed to enable the serious user to crib ROM routines for their own use. Again deeper penetration is inhibited by a lack of detail on passing the essential parameters to these routines, but a bit of ROM disessembly would soon reveal the relevent memory locations.

The final section of the book looks at the hardware which handles the software. A chip by chip architectural tour of the innards of the 128 reveals which does what, where and why.

The appendices take the form of detailed maps of zero page, Basic ROM and Kernal locations in both 64 and 128 mode.

As you can see, all of the essential elements of the C128 are dealt with to give more than a mere sketch map. The book is a browsing reference book, absolutely essential to anyone who needs a deeper understanding of this hunk of hi-tech wizardry.

E.D.

Touchline:

Author: *Tim Arnot.* ***Publisher:*** *Bitstream Publishing.* ***Price:*** *£9.95.*

Science & Engineering for the Commodore

Are you a mathematician, a scientist, an applied scientist or a programmer interested in all? If so, this is the book for you. It is not a book of elementary mathematical programming as handled by the C64, but is intended for those interested in the techniques of programming which handle more advanced equations.

The author has structured the book in a very detailed manner and gives a complete analysis of the object of each program prior to the listings. Your knowledge of mathematics will determine how easy you will find the book. As most mathematicians know, the Chi squared formula in statistics is relatively simple; getting the computer to interpret this, however, is a matter of some intricacy and it is here that the author excels. The programmes themselves are not lengthy, and the fundamental steps in advanced equation techniques are well interspersed with REM statements so that you know exactly what you are doing at each step. The programmes which I have checked are without fault.

Well, what does the book cover? The initial four chapters are a good general introduction to structured programming in Basic and other languages. Inclusive of flow diagrams; the speed and accuracy of the C64 in mathematical computation are discussed, while a comparative program of bubble, linear and 'quick-sort' times is given. These chapters should not be skipped, by any means as you will find some good ideas and suggestions in them.

The main part of the book is sub-divided into mathematics, chemistry, physics, biology and technical programmes. In all sections the programmes are well set out and there is an appendix at the back for listing symbols.

MATHEMATICS: fourteen programmes are included ranging from differentiation and numerical integration to statistics, probability, binomial distribution, vector analysis and matrix calculations. By far my favourite is the statistics and probability section where randomness, Chi squared calculations and Fourier analysis are defined in full, along with simple questions as sample entries. Vector analysis is equally well discussed and routines for the more familiar matrix calculations are not omitted.

At this point, I think it should be made clear that, while most of these problems can be solved using relevant calculators, the programmes themselves are designed as sub-routines to be incorporated into other teaching programmes. In other words, use them in conjunction with a suitable hires graphics programme which interlinks with Basic (Videobasic, Simons' Basic for example) to create your own educational project. This applies to all sections in the book.

CHEMISTRY: here the author uses relative files to maximum advantage in a small database. Naturally, you will require to store all the relevant data you wish in the database itself (in this instance the elements and attributes of the Periodic System); depending on the extent of your knowledge of chemistry, the database may be altered to your own requirements. This database is then followed by a 'reading file' which will call up all the information you have stored.

Other programmes in this section are a pH chart, a Titration calculator and a rather hefty program on quantum mechanics in relation to complex molecular orbits of chemical elements! This is a real classic, providing data such as charge densities, free valencies, bond ordering and electron energy. Printer output is provided here in view of the large amount of data computed.

PHYSICS: the first program here is a nice little insert to bring you back into orbit. It uses the TI built-in clock to give you a measurement of THREE overlapping times – try it. Two other useful programmes here detail Optical Geometry and Planetary Orbit Calculations.

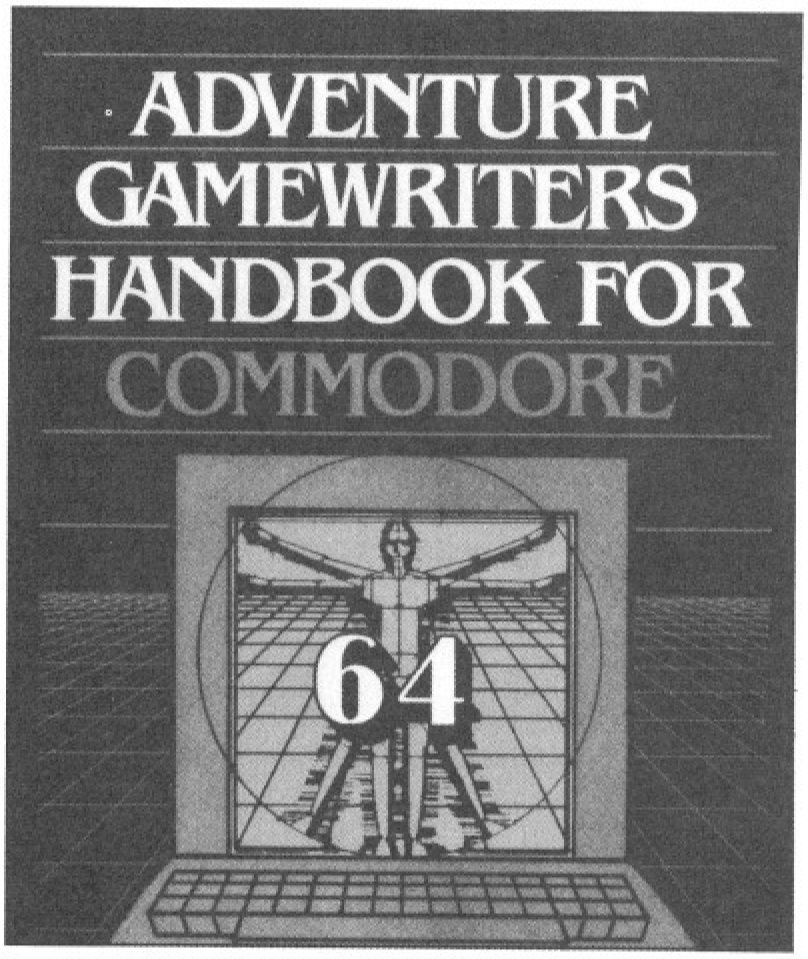
BIOLOGY: represented with a single program involving Dynamic Population Models. However, with what has been detailed before in the other sections, it should not be difficult to create programmes involving rates of enzyme reactions, etc. Indeed the scope is unlimited, if use is made of the statistical data in the mathematics section.

TECHNICAL PROGRAMS: here we have Heat Transmission and *total coverage* of combination circuits in relation to resistance, inductance, capacitance, serial circuits, parallel circuits, branch currents and node potentials.

What more can I say? Not a lot! The author is to be commended in presenting such a wealth of detail in such a compact program form. While the book is highly specialised, the specialists should welcome it! Highly recommended for the serious programmer. E.M.

Touchline:

Author: *Ranier Bartel.* ***Distributor:*** *Precision Software Ltd (Abacus Software).* ***Price:*** *£12.95.*



Adventure Gamewriter's Handbook

Great scribes who seek to write of tales of adventure but don't know how to start can seek refuge in the Adventure Gamewriter's handbook.

The book contains all you need to know to go adventuring on your C64 and contains listings for the adventure editor to create your game, the interpreter to play

it and two sample adventures called Gold Fever and the Enchanted Castle. The author explains the sometimes complex theory of adventuring clearly and consisely and takes you through a step by step guide on how to create an adventure with examples all along the way..

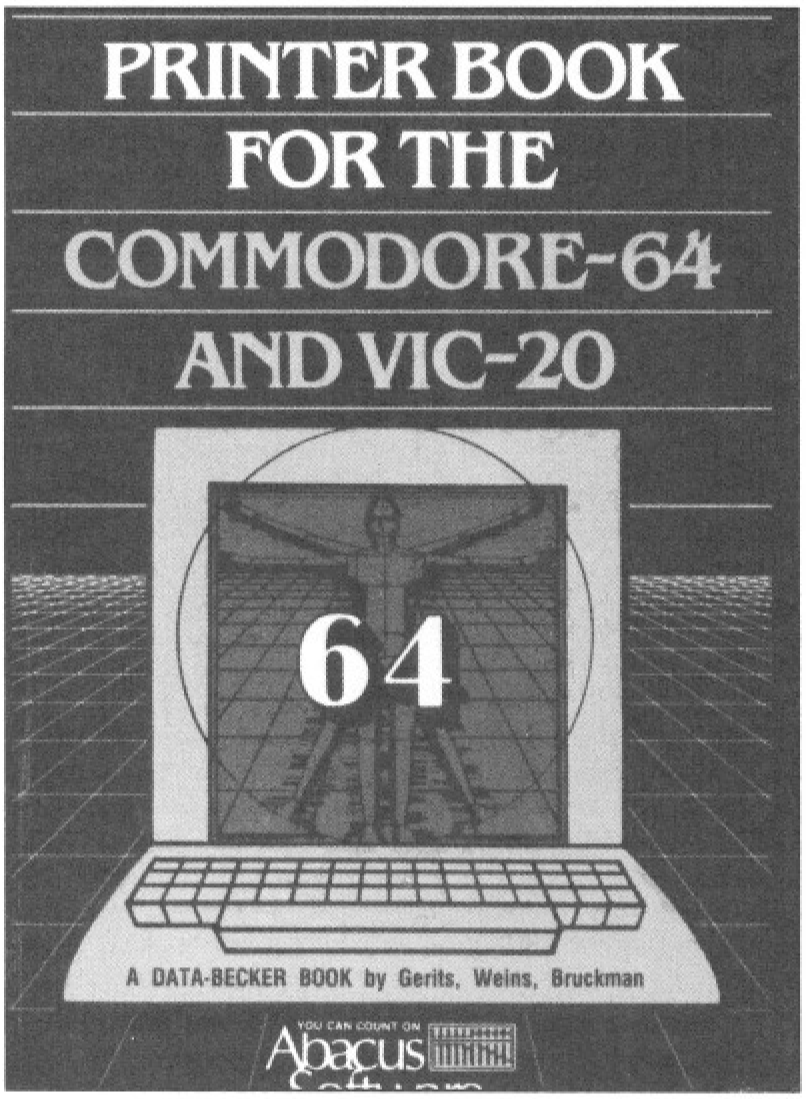
The process naturally starts with the idea (for example a haunted house or a quest), fleshing out your idea to form the plot, creating a map and programming these along with text descriptions, special events, player actions and commands, manipulating objects and limitations and counters.

The above theory is backed up with numerous examples as well as the gradual buildup of the adventure Gold Fever.

Unfortunately, the book and its game system offers little more than what already exists in programmes such as the Quill and since they're ready to LOAD in and go, why bother buying a book to start from scratch? Starting from scratch is not the only question but also the answer as some adventure authors think the Quill is too limited and will use the book's system as a base to write their own systems with the book as a tutor until they can go it alone.

Touchline:

Authors: *J. Walkowiak.* ***Title:*** *Adventure Gamewriter's Handbook.* ***Supplier:*** *Precision Software (Abacus Software).* ***Price:*** *£10.95.*



Printer Book for the C64 and Vic-20

Most people think of a printer as a device that simply plugs into their computer and prints out listings and graphics dumps. So how can anybody write a book about a printer that's over 300 pages long!

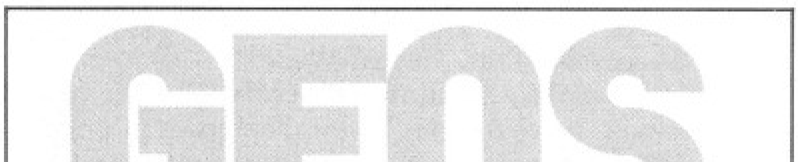
Apart from an introduction explaining how the authors could write a 300+ page book about a printer the book also includes notes about interfaces, printer ROM listings and a few useful listings.

Most of this is well written and at times a chatty book. It would only be used as a reference guide to check the connections on an interface or to delve into the ROM of the MPS 801 or VIC 1520 printer plotter. These heavy sections are nestled between programmes to create 3D objects, screen dumps, a simple text editor and poster size printouts.

However, the heavy technical sections and the light reading (and typing) lie uneasily next to each other and I feel that the authors would have done better to write two slimmer volumes, a beginners' guide packed full of useful programmes and routines and a separate technical guide. Since the two are mixed and the balance is towards the technical I would suggest beginners follow their own printer instructions and leve the rest to software packages such as Print Shop and Rainbird's Art Studio. T.H.

Touchline:

Authors: *R. Bruckmann, K. Gerits and T. Wiens.* ***Supplier:*** *Precision Software Ltd (Abacus Software).* ***Price:*** *£12.95.*



GEOS – Inside and Out

If you are still wondering how to get the best from your GEOS disk then this book will certainly solve your problems. It is well documented and illustrated, and takes you from the simplest aspect of GEOS manipulation to more advanced techniques. The book has been written specifically for GEOS V1.2 and most of the documentation will not work with the original V1 program.

The first two chapters are essentially for beginners; these chapters discuss copying GEOS for back-up purposes

continued on Page 127.

Text Compression

When you're trying to program a large masterpiece, the C64's memory capacity can sometimes seem very limiting. Data compression could be the solution.

By Allen Webb

Even though the 64 is graced with a full 64K of RAM, the current trend in software makes even this amount of memory seem insufficient. Consequently, it is frequently necessary to use some form of data compression. In the next few *Reliable Routines* articles, I will give some simple routines for the handling of data compression.

There are three main areas to be considered:

1. Text compression.
2. Compression of low resolution graphics screens.
3. Compression of high resolution screens.

In this article, I will concentrate on text compression.

In relation to its usefulness, text occupies a lot of memory and a more efficient storage method is frequently necessary. One method is to replace common words with a single byte, as in Table 1.

Table 1

1	the
2	and
3	to
4	for

These frequently used words could be replaced with a single byte with bit 7 set to distinguish it from ASCII codes. So "the" could be replaced with 129 and so on. This is the basis of tokenisation used by Basic. With long words, this is a very effective method but since you can only have 128 tokens, the overall compression is only about 20%.

There are some drawbacks in writing such a compression system:

1. You must sort out your list of 128 frequently used words.
2. You must tell the system how to code upper case letters. You will want to be able to use "the" and "The", for example.
3. The code will be quite long with the need for a clever interpreter.

This system is quite complex, however, and there is an easier way.

The Simple Method

The simple approach limits you to 31 characters but will suffice for many applications.

Imagine that you number the alphabet from one to 26. In addition, you number five punctuation marks from 27 to 31. Each letter is represented by five bits even though it occupies a whole byte. Three characters would occupy 15 bits which could be crunched into two bytes. Thus we achieve an instant 33% compression from three to two bytes.

So how do we do it? Consider Table 2 in which the first three characters of our list are shown.

First we lop off the top three bits of each code value, as in Table 3.

The next steps are:

1. Move the top three bits of the code for B into the bottom three bits of the code for A.
2. Move the five bits of the code for C into bits one to five of the code for B and set bit zero of B to zero.

If we do this we get:

00001000 10000110

These bytes are then stored and decoded on demand. Since all you have is a string of bytes, zero bytes are inserted in the encoded text as a sentinel. This is why you can only have codes one to 31. If you were to encode two consecutive code zero's, you would create an erroneous sentinel in the final data. This may sound very complicated but don't worry since the routines given later handle everything.

The Listings

The donkey work of the encoding

Letter	Code	Code in Binary
A	1	0000001
B	2	0000010
C	3	0000011

Table 2

A	B	C
00001	00010	00011

Table 3

and decoding is handled by the machine code in Listing 1.

This has two entry points, firstly:

1. SYS 40192 ($9D00).

This converts three bytes in locations 852, 853, 854 to two bytes which are put in locations 856 and 857. The second entry point is at:

2. SYS 40195, ADDRESS

This decodes a block of data starting at the specified address, ending when a zero byte is found. The text is printed starting at the current cursor position in the current cursor colour. To give you access to RAM not normally accessible to Basic, you can use the RAM under the Basic ROM.

Since the system will only accept the normal alphabet plus space, comma, full stop, quotes and question mark, any other characters are detected and rejected. The editor allows you to type in text and amend it by use of the DEL key only. Pressing RETURN terminates text entry and continues processing. It is important to understand that text must be entered in the form that you want to see it after compression. So if you want tidy text with no word wrap around, enter it in that form. You may enter up to 254 characters at a time. Any attempt to press RETURN with no text input is ignored.

When RETURN has been pressed, you will be asked where you want to put the text. When you first run the editor, a default value of 40960 will be offered. If text has been compressed, the first free address after the last compressed code will be offered. You may accept the default by pressing RETURN or enter your own address. The text compression will, if the text is long, take a few seconds. Once the compression is complete you will be given some statistics. You are advised to note carefully the start address of each block of code.

The test option allows you to confirm that your text is correctly compressed.

The SAVE option will save the block of text specified. It will handle code stored in addressed up to $CFFF (53247). Any saved code can be loaded into your own programs by:

LOAD "file name", 1, 1
or
LOAD "file name", 8, 1

The LOAD option allows you to resume coding at a later date. This option does not tell you the end address of the last piece of code, so remember to write it down!

So how do you use encoded data in your own programs? Easy. Imagine that you hold the start address of each piece of text in an array SA(). Listing 3 gives a code fragment which will do the job.

Listing 3

```
10 INPUT"MESSAGE NUMBER";M
E
20 SYS 40195, SA(ME)
```

This should start you off. Look out in the near future for an article on compressing graphics. YC

LISTING 1

```
PROGRAM: TEXT EDITOR

DD  0 IFZZ=0THEN5
B1  1 IFZZ=1THENZZ=2:LOADFI$,8,1
36  2 IFZZ=2THENPRINT"[CLR]":GOT
    O490
78  5 FORI=870 TO 924: READ X: P
    OKEI,X:T=T+X:NEXT
FF  6 IF T<>5940 THENPRINT"DATA
    ERROR":END
5A  10 CLR:POKE53280,0:POKE53281
    ,0:POKE646,3:DE$=CHR$(20):PO
    KE56,157:CA=40960
00  15 PRINTCHR$(147): GOTO490
6F  20 PRINT"[CYAN,CLR,DOWN7,S*4
    0]";
CD  100 POKE204,0:S$="":PRINT"[H
    OME]";
31  110 GETI$:IFI$=""THEN110
53  130 IF I$="?"ORI$="."ORI$=",
    "ORI$=" "ORI$="'"THEN170
68  140 IFI$=DE$ AND LEN(S$)>0TH
    ENS$=LEFT$(S$,LEN(S$)-1):PRI
    NTCHR$(20);:GOTO190
AA  150 IFI$=CHR$(13)THEN210
E3  160 IFI$<"A"ORI$>"Z"THEN110
67  170 IFLEN(S$)=255THEN110
BF  180 S$=S$+I$
68  190 PRINT"[HOME]"S$;
73  200 GOTO110
F4  210 POKE207,0:POKE204,1
33  220 PRINT"[HOME,DOWN8]CODE A
    DDRESS ";CA;:INPUT"[LEFT8]";
    CA
63  230 IL=LEN(S$):IFIL=0THEN20
06  240 IF IL/3=INT(IL/3)THEN260
86  250 S$=S$+" ":GOTO230
1D  260 C1=1:TL=IL+1:C2=1:CP=0
7F  270 FOR I=1TO3
38  280 CH$(I)=MID$(S$,C1,1)
E8  290 C1=C1+1:NEXT
99  300 FOR I=1TO3
83  310 C$=CH$(I)
93  320 IFASC(C$)>63ANDASC(C$)<9
    1THENC=ASC(C$)-64:GOTO380
9E  330 IFC$=" "THENC=27
87  340 IFC$="."THENC=28
18  350 IFC$=","THENC=29
EF  360 IFC$="?"THENC=30
AE  370 IFC$="'"THENC=31
59  380 POKE 852+I,C:NEXT
77  390 SYS 40192
FA  400 POKE CA+CP,PEEK(856):CP=
    CP+1
07  410 POKE CA+CP,PEEK(857):CP=
    CP+1
B6  420 IFC1<>TL THEN 270
A5  430 POKE CA+CP,0
0D  440 PRINT"[HOME,DOWN9,YELLOW
    ]COMPRESSED CODE START ADDRE
    SS..[C6]"CA
7B  450 PRINT"[YELLOW]COMPRESSED
     CODE END ADDRESS....[C6]"CA
    +CP:CA=CA+CP+1
B6  460 PRINT"[YELLOW]COMPRESSED
     CODE LENGTH.........[C6]"CP
    +1:CP=CP+1:TL=TL-1
66  470 PRINT"[YELLOW]PERCENT RE
    DUCTION OF INPUT.....[C6]"IN
    T(100*(TL-CP)/TL)"%"
1C  480 PRINT"[CYAN,S*40]";
E8  490 PRINT"[HOME,DOWN14,C7]CH
    OOSE ACTION"
C9  500 PRINT"[WHITE]1[YELLOW]..
    TEST TEXT"
A9  510 PRINT"[WHITE]2[YELLOW]..
    ENCODE A STRING"
C2  520 PRINT"[WHITE]3[YELLOW]..
    SAVE COMPRESSED CODE"
AF  530 PRINT"[WHITE]4[YELLOW]..
    LOAD COMPRESSED CODE[CYAN]"
B7  540 GETI$:IFI$<"0"ORI$>"4"TH
    EN540
98  550 ON VAL(I$) GOTO 560,20,5
    80,670
```

```
04 560 INPUT "[CLR]TEXT ADDRESS
   ";TA:PRINT"[CLR,WHITE]TEXT S
   TARTING AT"TA"READS:"
86 570 PRINT"[C8,DOWN]";: SYS 4
   0195,TA:GOTO490
90 580 PRINT"[CLR]SAVE COMPRESS
   ED CODE[DOWN]"
CA 585 INPUT"[CLR]START ADDRESS
   ";SA
D0 590 INPUT"FINISH ADDRESS";FA

C5 600 INPUT"DEVICE";DE
BE 610 INPUT"FILE NAME";FI$
94 620 SYS 870 FI$,DE,2,SA,FA
6E 630 PRINT"[CLR]":GOTO490
D9 640 DATA32,212,225,32,253,17
   4,32,138,173,32,247,183,165,
   20,72,165,21,72,32,253
80 650 DATA174,32,138,173,32,24
   7,183,165,1,41,254,133,1,166
   ,20,164,21,104,133,21
25 660 DATA104,133,20,169,20,32
   ,95,225,165,1,9,1,133,1,96
15 670 PRINT"[CLR]LOAD COMPRESS
   ED CODE[DOWN]"
35 680 INPUT"DEVICE";DE
BE 690 INPUT"FILE NAME";FI$
20 700 ZZ=1:GOTO0
```

LISTING 2

```
PROGRAM: TEXT EDITOR

AF  10 REM*************************
    ***
D3  20 REM* TEXT COMPRESSION COD
    E *
BB  30 REM*************************
    ***
72  2000 FORL=0TO15:CX=0:FORD=0T
    O15:READA:CX=CX+A:POKE40192+
    L*16+D,A:NEXTD
82  2010 READA:IFA<>CXTHENPRINT"
    ERROR IN LINE";2040+(L*10):S
    TOP
0F  2020 NEXTL:END
3A  2040 DATA76,109,157,76,6,157
    ,32,203,157,32,241,157,165,1
    ,41,254,1864
7D  2050 DATA133,1,160,0,162,0,1
    77,170,240,37,141,88,3,200,1
    77,170,1859
BF  2060 DATA141,89,3,32,155,157
    ,173,85,3,157,0,158,232,173,
    86,3,1647
34  2070 DATA157,0,158,232,173,8
    7,3,157,0,158,232,200,76,22,
    157,157,1969
6A  2080 DATA0,158,160,0,185,0,1
    58,240,9,32,221,157,153,0,15
    9,200,1832
3E  2090 DATA208,242,153,0,159,1
    65,1,9,1,133,1,169,0,160,159
    ,32,1592
CD  2100 DATA30,171,96,32,46,44,
    63,39,27,28,29,30,31,14,86,3
    ,769
87  2110 DATA14,86,3,14,86,3,14,
    86,3,46,85,3,14,86,3,46,592
4A  2120 DATA85,3,14,86,3,46,85,
    3,173,85,3,141,88,3,14,87,91
    9
DB  2130 DATA3,173,86,3,13,87,3,
    141,89,3,96,173,88,3,41,248,
    1250
2D  2140 DATA74,74,74,141,85,3,1
    73,89,3,41,63,74,141,87,3,17
    3,1298
96  2150 DATA88,3,41,7,10,10,141
    ,86,3,173,89,3,41,192,74,74,
    1035
A6  2160 DATA74,74,74,74,13,86,3
    ,141,86,3,96,32,253,174,32,1
    38,1353
E6  2170 DATA173,32,247,183,165,
    20,133,170,165,21,133,171,96
    ,162,0,221,2092
59  2180 DATA104,157,240,9,232,2
    24,5,208,246,24,105,64,96,18
    9,99,157,2159
DF  2190 DATA96,160,0,169,32,153
    ,0,158,200,208,250,96,29,162
    ,166,0,1879
```

Books (continued from page 124).

(advisable), the formatting and handling of work disks and the creation of a 'letter file' disk. Read these two sections rather carefully as there is a lot of information here on opening and closing of files, flipping, page reading, file deletion, etc.

The 'real' handling of GEOS starts at chapter three through to five. It includes a detailed description of the different operations available to you in the system, with an excellent selection of screen dump illustrations to supplement the instructions. Indeed there are a total of 84 of the latter, which will give you some idea of the work that has gone into writing this book.

Initially your screen has a display of seven icons (Geos, Geos Boot, Geos Kernal, Desk Top, Geopaint, Geowrite and Backup); this is called the Desk Top. The authors have discussed these in considerable detail – so much so that you should be joy-stick clicking in top gear by the time you have read it all once, twice or three times. Certainly you will want to explore more and more. Everything is here to give you a complete grasp of all operative systems.

It has been said more than once, that GEOS is most suited as a word processor and not as an artist's tool (perhaps such contentions were made with GEOS V1?). In any event, read up the Geopaint Section where you will find that there is ample opportunity for artistry; all aspects of painting, cycling, pattern filling, cutting, pasting, mirroring, use of the 32 brushes available,etc, have been well described; V1.2 is most certainly an artist's tool as the authors show.

Taking this a step further, there is a very good section on 'organising and planning with Geopaint'. Here the authors have extended the basic concepts to planning rooms, gardens, schematic electronic circuits,etc.

Should you care to type in a program called Filemaster (ten pages) you have here a program which will transform your standard C64 files to the GEOS format; also incorporated is a 'sprite designer' to create new icons. Again this is fully described. Abacus Software have a disk available with all the programmes in the book (Contact Adamsoft concerning this if you wish to purchase the disk.)

Chapter six (Inside GEOS) is fairly lengthy and is intended essentially for the machine code programmer. A single step simulator is listed for direct entry to memory with a monitor. This should then be saved to disk, from which it can be reloaded as a GEOS accessory in conjunction with Filemaster. A Basic loader is listed for the simulator. The concept of the simulator is to investigate the GEOS operating tool and many facets of creating self-made windows are detailed. All this is fully explained and documented and provides the programmer with opportunities to extend GEOS.

The book has a good glossary and is well indexed. It only remains to be said that it is obviously of immense value to the GEOS user, particularly in view of the non-prohibitive price. A highly commendable book. **E.M.**

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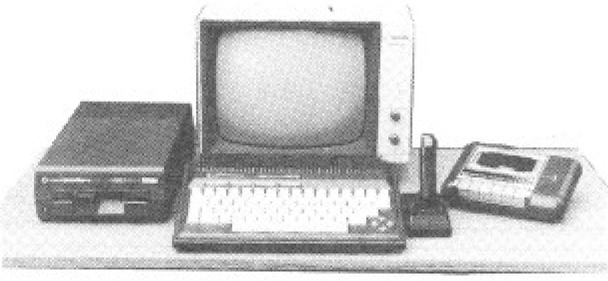
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B R E A K

Competition Winners

A bumper bundle of prizes is winging its way to winners of *Your Commodore* competitions this month.

Have you entered one of the competitions below? Is your name there? Will a game be dropping through your letterbox in the next few days?

Read on and find out.

Super Sunday

Our March 1987 competition gave 30 lucky people the chance of a copy of Super Sunday from Nexus, which will be touching down in the homes of the following people:

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Software for Sale Important Notice

A number of people have reported an error when LOADing drawings that have been SAVEd using the TEC DRAW 64 program.

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Apologies are also due to people who experienced delays with software ordered in late June/early July. Unfortunately, problems were caused by problems with the postal service within London.

Escape From Paradise

The May 1987 competition gave away 25 copies of Anco's Escape From Paradise as prizes. The following people will all receive a copy of the game:

Bradley Sproson, Congleton; T. J. Catley, Woking; Brian Stone, Jasksdale; Ian Flory, Banff; C. S. Irons, Littlehampton; Chris Garbutt, Basildon; D. Pengilly, Cranwell; D. Gerken, Colchester; Gary Finney, Stoke-On-Trent; D. G. Dunk, HQ Afcent; G. Usherwood, Stokton-On-Tees; Stuart Bateman, Middlesbrough; Nik Cain, Royston; Barry Mooney, Newry; Stephen Citrone, Fatfield; Wayne Haverson, Brighton; Stuart Scattergood, Deeside; G. A. Catchpole, Canvey Island; Marion Rizzo; Malta; Kevin Gibson, Durham; A. G. McLellon, Folkstone; David Fisher, Birmingham; S. J. Townsend, BFPO 42; D. Slatter, Dovercourt; C. A. Smith, Tewkesbury.

OOPS!

We have had a number of queries regarding errors in the Cruncher programmes printed in the July 1987 issue of *Your Commodore*.

There are no errors in the program printed. However the variable L that is set up to report the line number of any lines with a typing error in them starts off at the wrong value in both programmes. This doesn't stop the program from working, however, if you have made a mistake while typing the program in, the program will give you an incorrect line number for correction. The lines to be replaced are as follows:

The C64 Version:
20 D=49152:L=170

The Plus/4 Version:
40 D=4096:L=180

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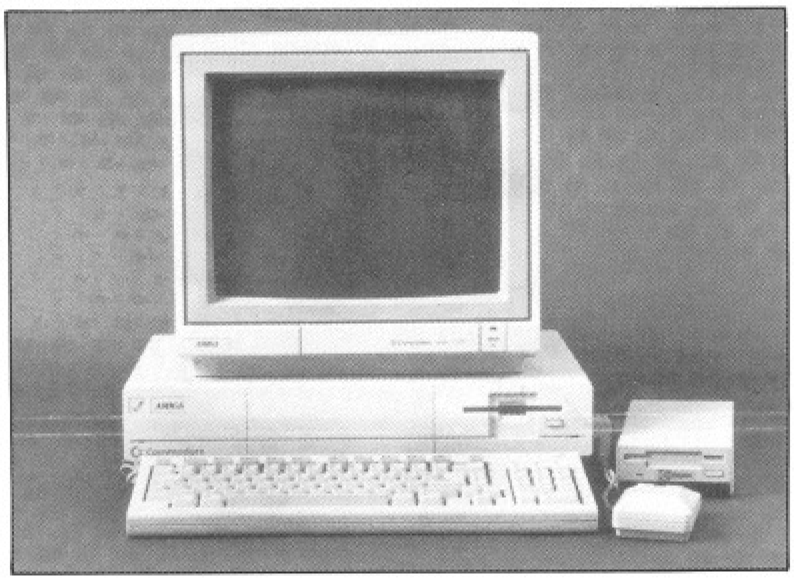
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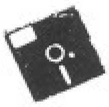
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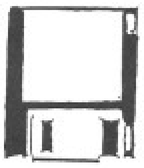
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